



DAKOTA COUNTY NATURAL SYSTEMS PLAN
Parks, Greenways, Natural Areas, and Easements

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Dakota County Parks Native Land Acknowledgment

We at Dakota County Parks respectfully acknowledge that Dakota County is Dakota homeland, land significant and sacred to the cultural identity of past, current, and future generations of the Dakota people, and other native peoples from time immemorial. We commit to understanding, respecting, and partnering with Indigenous communities as together we care for the land, wildlife, air and water here. Let our actions demonstrate our resolve and commitment, bringing to life the truth of these words.



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Executive Summary

The **Dakota County Natural Systems Plan** (NSP) provides operational guidance for two program areas within The Dakota County Parks Department: Land Conservation and Natural Systems Management. *Land Conservation* sets aside and protects land with significant natural resource value from development and other uses, based on the notion that these lands provide greater ecosystem and societal benefits in their natural state. *Natural Systems Management* works to restore, enhance, and manage natural processes, communities, and functions. These two program areas are intended to work hand-in-hand, on the premise that protected land is not truly protected unless it's also managed.

The **Goals Chapter** of this plan includes objectives and strategies for land protection and natural systems management, based on the high-level guidance of the [2050 Dakota County Parks Vision Plan](#), and incorporating lessons learned from implementing the County's two legacy plans for land conservation and natural resources management. Objectives also target new initiatives to help improve the business operations of the program.



The **Implementation Chapter** sums up how the programs can move forward to achieve their visions. As an operational plan, the NSP addresses setting the pace of restoration; prioritization; desired outcomes; enhanced metrics; costs and funding; staffing needs; and engaging the public with information, education, and volunteer opportunities.

Desired outcomes of this plan are provided for the first five years after plan adoption, recognizing the complexities of managing living systems and a need for flexibility. Key initiatives include:

- Restoration of an additional 1,500 acres of park land
- Restoration of 366 acres of Greenway corridor lands
- Restoration of 944 acres of natural area easements
- Long-term management of previously restored lands in the County Park System, increasing from 2,400 acres in 2026 to 3,700 acres by 2031
- Improvements to water quality
- Management of wildlife, including re-introduction of several native species



Regal Fritillary, proposed re-introduction

Estimated costs for the next five years include \$9.8 M for long-term management of restored park and greenway lands owned by the County and an estimated County share of \$0.86 M on a total cost of \$23 M for acquisition and restoration work on 3,297 acres (parks, greenways, easements). The annual County cost is approximately \$2.13 M. Restoration and acquisition work have been supported largely through outside funding with a small County match. Long-term management historically has been mostly a County financial obligation, so this plan suggests further evaluation of opportunities to secure stable funding for this essential work. Funding will be sought from external sources and annual budget and CIP requests will be subject to Board approval.

This Plan will be revisited regularly and updated within the next five to seven years.

Chapter 1: Introduction and Plan Purpose

Dakota County exists within natural, societal, and economic systems, three major spheres of influence. Societal and economic systems ultimately depend on natural systems that provide drinkable water, pollinator services, flood control, heat moderation, health benefits, and many other essential benefits for which there is no fee.

The economy's raw resources are also provided by natural systems, including timber, aggregate, water, soil for growing food and fiber crops, and iron for manufacturing. Natural systems also serve as a sink for waste products. When this hierarchy is ignored, social and economic systems suffer. Services that were freely provided by natural systems must be replaced, often at great cost. Examples include remediation of PFAS and nitrates in ground, air, and drinking water; and remediation of flooding and declining water quality and supply related to increased impervious surfaces.

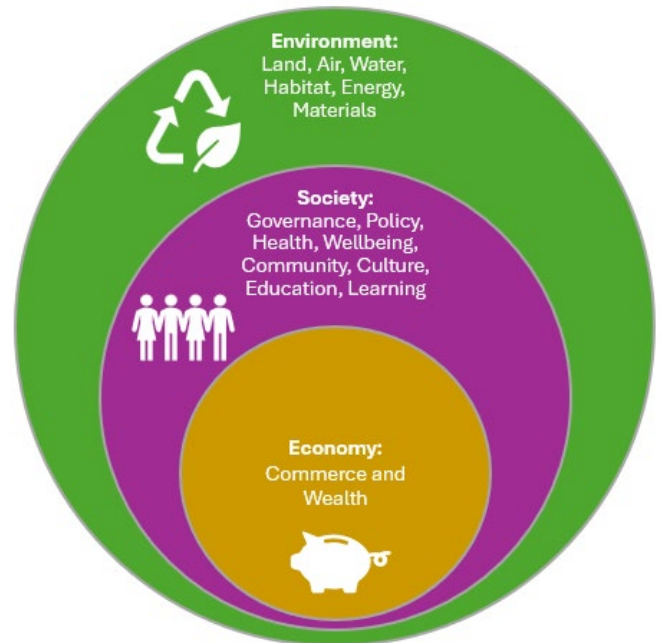


Figure 1: Nested Spheres within Natural Systems

Dakota County's commitment to protecting, restoring and managing the natural systems within its boundaries and the County's work with partnering jurisdictions are securing a strong foundation for a healthy economy and community. At finer detail, the natural areas of the County (prairie, savanna, wetlands, forest) were made up of the strong "cloth" of a diverse mix of "fibers," the plants, animals, fungi, and other organisms that exist within the physical/non-living environment and the natural processes that created and influenced them. These elements were woven together over millennia to make the natural "cloth" resilient, with the ability to withstand and even benefit from disturbances such as drought, fire, flood, and disease.

By eliminating or greatly reducing species, represented by the strands or fibers that form the cloth, natural systems are less able to withstand disturbances, natural or those imposed by human action. The natural cloth developed holes and is much less strong, less able to withstand pressure. Understanding the role of natural areas and systems, imparts the proper significance and importance to the County's economy and community. It is acknowledged that many impacts to the local ecological system occur at a larger and broader scale, with national and global actions certainly impacting Dakota County. However, there is much that State, County and City agencies can do to improve the natural systems that all rely on and therefore, provide a more resilient community and economy.



Figure 2: Fabric of the Natural World

Nearly 34,000 acres of land are publicly protected for natural resource values and/or public use in Dakota County, roughly 9 percent of the county's total area. Of this, Dakota County owns and manages 5,850 acres of public park land and additional land in greenway corridors and has protected more than 12,000 acres through conservation easements on private lands and natural area acquisitions. These protected lands play a vital role in maintaining biodiversity and ecological integrity. Public protected lands provide additional societal benefits through opportunities for recreation, experiencing nature and other vital ecosystem services.

Land protection must be accompanied by long-term natural resource management to retain and enhance the ecological values that merited the initial protection efforts. This plan will further guide the County's programs in land protection and stewardship. It incorporates the two legacy plans that have guided the County's land protection and stewardship programs, the 2017 Natural Resources Management Systems Plan (NRMSP) and the 2020 Land Conservation Plan (LCP).

The NSP was prepared to:

- Protect ecologically valuable lands amid development, growth, and habitat fragmentation
- Ensure consistent, science-based management for long-term ecological resilience
- Provide a framework for funding, restoration priorities, and partnerships

1. County Role: Previous Plans and Programs

A. Planning Hierarchy

Dakota County plans for its parks and protected areas using a hierarchy based on:

1. the **2050 Vision Plan** providing overarching direction for the system
2. three **operational plans** guiding system-wide program areas (including this plan), and
3. individual **Natural Resources Management Plans (NRMPs)** with detailed guidance for specific park and greenway units. Plans are also prepared for natural area easements.



Figure 3: Plan Hierarchy for Parks and Protected Open Space

B. County Parks Natural Resources Management

Dakota County began its park system in 1971, establishing boundaries for two parks and initiating the land acquisition from willing sellers. Development of recreational amenities, such as trails and picnic grounds, began as soon as sufficient land had been acquired. Additional parks were created, bringing the total to six parks by 2012. Natural resources efforts were sporadic until the late 1990's, when a system-wide evaluation proposed a more comprehensive approach to natural resources management and a limited number of targeted restoration projects began.

In response to public interest in more effective parks stewardship, Dakota County accelerated its efforts with the 2017 Parks Natural Resources Management System Plan (NRMSP). The NRMSP provided a comprehensive framework guiding the restoration and management of ecosystems in County parks, greenways, and conservation easements. Its primary goals addressed:

- **Ecological restoration** to improve the diversity and quality of native plant communities,
- **Wildlife habitat management** to support rare species and pollinators
- **Water quality improvement** through better land management

Much has been accomplished since NRMSP adoption. More than half of the lands targeted are restored or in active restoration, an intensive three-to-five-year process. Other highlights include:

- Bison reintroduced in a restored prairie range at Spring Lake Park Reserve
- Greenhouse built for propagating native plants from locally harvested seed
- Rare plant species discovered, including first recorded observations in the county
- Volunteer program participation, with 5,331 hours in 2025 from 1,102 volunteers
- Three wildlife tunnels under Cliff Road installed with Transportation
- Completion of more than 30 wildlife projects in parks
- Growth in staffing from five positions in 2018 to 13 in 2024, as program duties have expanded
- Receipt of \$6.3 million for natural resources since 2020 from federal, state and other outside sources. County partners brought an additional \$1.8 million to natural resource projects.
- Monitored quality at six lakes in parks, surveyed fish, and improved shorelines,



Spring Lake Park Reserve Bison Herd



Native Plant Propagation in Parks Greenhouse

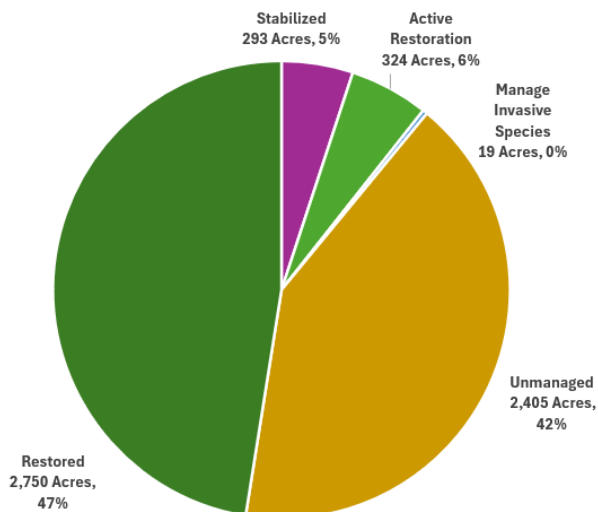


Figure 4: Status of County Lands and Easements

C. Land Conservation in the County

Dakota County's 2001 Farmland and Natural Area Protection Plan was the first of its kind in the state. The Plan identified priority natural areas and farmland and worked with willing landowners on permanent land protection. Residents passed a \$20 million bond referendum in November 2002 to fund the new program. An updated Land Conservation Plan (2020) refined the vision with Conservation Focus Areas (CFA), an interconnected network of remaining high-quality natural resource areas that are priority areas for program eligibility.

Land Conservation Accomplishments

As of 2025, the County had spent \$24.4 million, received \$26.5 million in landowner donations, and leveraged \$8.4 million in non-County funds to protect more than 12,000 acres:

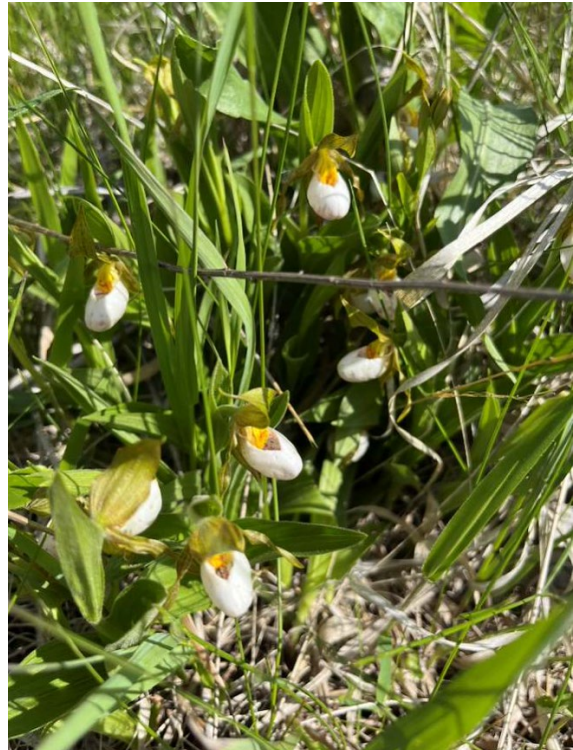
- 71 agricultural easements (including protected buffers): 7,812 acres
- 58 natural area easements: 2,042 acres
- 30 natural areas in fee title: 2,342 acres
- 20-plus miles of shoreline
- 9 County Park Conservation Areas, 356 acres



Figure 5: Sign Placed on Easement Properties



County Park Conservation Area on the Vermillion River



Ladyslippers on Protected Land

2. County Ecosystem Highlights

Dakota County's natural legacy is founded on a uniquely rich endowment — abundant, diverse resources that have drawn people to this area for more than 8,000 years and will continue to draw people in the future. This richness is a product of Dakota County's location at the meeting place of major natural systems:

- The confluences of three of Minnesota's great rivers: the Minnesota, Mississippi, and St. Croix
- The edge of the most recent glaciation, resulting in dramatically varied outwash, terminal moraine, and driftless landforms
- The convergence of major ecosystems: prairie, big woods, oak savanna, wetlands, and bluff lands

Dakota County's natural assets included prime agricultural soils, deep and highly fertile, formed from the original prairie ecosystem that made up 80% of the area pre-settlement. An abundant supply of clean groundwater was also essential for Dakota County's early agrarian settlement.

Dakota County's existing parks capture some of the diversity that existed pre-settlement, with landscapes that represent Big Woods, Prairie, Floodplain Forest, Aspen-Oak, and Oak Savanna ecosystems.

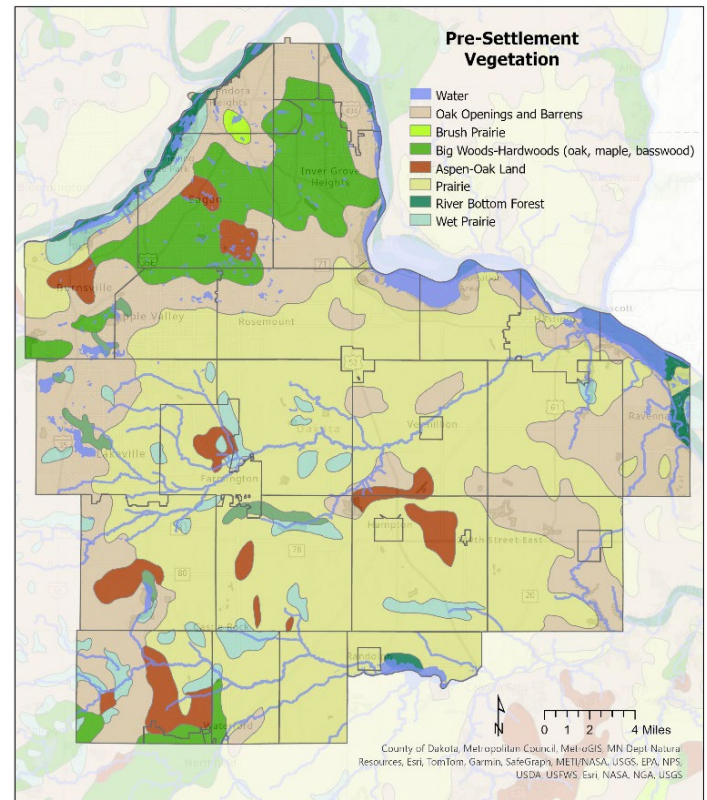


Figure 6: Pre-settlement Vegetation, Marschner Map

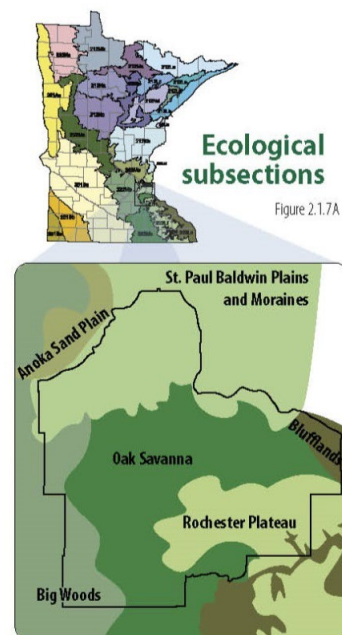


Figure 7: Historic Ecological Subsections in Dakota County, MN DNR

3. The Need for Natural Resource Protection and Management

Dakota County's original pre-settlement landscapes were primarily prairie but also represented some of the greatest biological diversity in the state. Over 900 species of plants have been documented by the Minnesota Department of Natural Resources on Minnesota's remaining prairies. The County's remaining plant and animal diversity is at risk with ongoing loss and fragmentation of habitat by development, with irreversible changes to natural systems.

Development and conversion of natural lands to agriculture altered and damaged natural systems in the County, with consequences to local communities. Rivers, streams and lakes have become increasingly polluted from urban and agricultural runoff. Groundwater is being pumped more rapidly than it is being replenished and contamination is a growing concern. Soil health has been compromised by development, erosion, compaction, and chemicals. Wildlife habitat has been lost, fragmented, and degraded, resulting in declining plant and animal populations and overall species diversity. Many natural places enjoyed and valued by generations have disappeared across the County.

Today there is growing consensus that our natural resources create essential infrastructure for individual and community health and well-being. We all need drinkable water, breathable air, reliable and healthy food, and a safe place to live. It's not difficult to find evidence of declining environmental quality and lost natural places, whether relative to the world of our childhood, that of our parents and grandparents, or earlier. The following indicators provide a snapshot of water quality, natural areas, wildlife, and County residents' concerns about environmental quality.

- Despite having a highly diverse mix of landscapes and ecosystems in the mid-1800s, only an estimated three percent of Dakota County's natural landscapes remain.
- State impaired waters listings identify waterbodies that no longer provide for designated uses, such as swimming or drinking. The number of impaired waters increased over time, although some lakes have recently been de-listed. New issues emerge, and new impairments are defined.
- Wetlands are critical to overall water quality and flood control. More than 85 percent of Dakota County's settlement-era wetlands have been lost.¹
- Habitat loss has led to declining wildlife populations and diversity. Nationally, bird populations dramatically illustrate this decline since the 1970s.² Grassland bird species have declined in the U.S. by more than 50 percent.
- Agricultural drain tile in large areas reduces surface water infiltration to recharge groundwater.

Scientific surveys of Dakota County residents, consistently show strong support for land protection and resource management, with the strongest support for water quality, wildlife habitat, and natural areas.

2025 County Survey, Percent identifying investing in preserved land as "Essential" or "Very Important"	
Approach	Percent
Protecting and improving water quality	88
Protecting and improving wildlife habitat	81
Protecting and improving natural areas	81
Increasing access for outdoor recreation	70

Figure 8: Table from 2025 Residential Survey

¹ Minnesota Wetlands Conservation Plan, Version 1.02, 1997, Minnesota Department of Natural Resources, St. Paul, Minnesota.

² Decline of the North American Avifauna, Science, Sept. 2019

³ Residential Surveys, <https://www.co.dakota.mn.us/Government/Analysis/ResidentSurvey/Pages/default.aspx>

Living in a modern world defined by development, transportation, and convenience requires balance between controlling our built environment and protecting the natural environment that sustains us all. To protect natural resources and systems, land conservation permanently reserves lands with significant natural resource value and manages them to restore natural functions. It is based on the concept that natural resources and natural places provide ecological, societal and economic benefits within and beyond the conservation area boundaries (Ecosystem Services). Land conservation includes *protection*, which restricts use of the land. To be effective over time, protection must also be accompanied by ongoing *natural resource management*.

Ecosystem services are the benefits that protected and restored forests, grasslands, and wetlands provide, and can include:

- Absorbing nutrient runoff, toxins, and sediments for cleaner water downstream
- Promoting infiltration and groundwater recharge and protecting drinking water supplies
- Moderating drought, flood, and air temperature
- Improving soil health
- Providing wildlife habitat and sustaining pollinators
- Providing opportunities for recreation, education, and inspiration
- Mitigating and adapting to climate change
- Pest control

4. Overview of Protected and Managed Resource Lands

Many significant natural areas have been conserved in Dakota County, beginning with the “land protection era” that reserved lands that otherwise would likely have been altered and/or developed. Federal and state government helped establish the Gores Pool #3 Wildlife Management Area (WMA) on the Mississippi River in the 1930s when the Red Wing lock and dam was built. The WMA has over 6,700 acres of natural habitat. The state also created Fort Snelling State Park (3,711 acres), various wildlife and aquatic management areas (12,923 acres), and scientific and natural areas (1,007 acres) in and near the County. The federal government protected 4,400 acres of the Minnesota River Valley in Dakota County as part of a rare urban national wildlife refuge.

A. Federal Lands

- **Minnesota Valley National Wildlife Refuge:** Managed by the U.S. Fish and Wildlife Service to conserve wildlife and offer connection, education opportunities, and recreational experiences.
- **Mississippi National River and Recreation Area:** Managed by the National Park Service in partnership with state and local governments to protect the river’s natural and cultural history.
- **Waterfowl Production Areas:** Managed by the U.S. Fish and Wildlife Service to protect habitat.

B. State Lands

Minnesota Department of Natural Resources (DNR)

- **Aquatic Management Areas (AMA):** Publicly accessible waters managed to provide angler/habitat management, and education/research.
- **Fishing Access Sites:** Cooperation with local units of government to install and maintain accessible fishing piers and shore fishing sites.
- **Scientific and Natural Areas (SNA):** Representative high-quality natural communities that are part of a protected national network of ecological areas for research, education, and biological diversity. Public access is allowed.
- **State Parks:** Preserve natural and cultural areas with nature-based recreation.
- **State Trails:** Offer biking, hiking, horseback riding, mountain biking, and winter recreation.
- **State Water Trails:** Routes on lakes and rivers for canoeing, kayaking, and paddle boarding.

- **Water Access Sites:** Public boat launches and carry-in access sites developed with local governments
- **Wildlife Management Areas (WMA):** Areas for wildlife production, public hunting, fishing, trapping, and other compatible recreation.

Minnesota Board of Soil and Water Resources

- **State Wetland Bank Easements:** Conservation easements fulfilling wetland bank and some project-specific wetland replacement requirements.

C. Dakota County Parks

The Dakota County acquired land for two parks in the late 1960s: Lake Byllesby and Holland-Jensen (now Lebanon Hills Regional Park). Dakota County's Parks are classified as Regional Parks, Regional Park Reserves, and County Parks based on use, resource status, development, and funding.

Regional parks are part of the seven-county Metropolitan Parks System and partially funded by the Metropolitan Council, which notes that regional parks "should contain diverse natural resources and the ability to provide for a wide range of natural resource related recreational opportunities." Access to water bodies suitable for recreation is important. Regional parks typically are 100 to 1,000 acres.

Regional Park Reserves "are expected to provide a diversity of outdoor recreational activities and provide, protect and manage representative areas of the original major landscape types in the metro area." Optimal size exceeds 2,000 acres, while the minimum size is 1,000 acres.

County Parks are not part of the Metropolitan Regional Park system but have significant local value or resources.

Dakota County's parks include a mix of prairie and grasslands, woodlands and forests, and surface water (lakes, ponds, wetland, and rivers), which comprises 11 percent of park acreages. All parks include or adjoin waterbodies, except Dakota Woods Dog Park.

Dakota County Parks

- Lake Byllesby Regional Park (620 acres)
- Lebanon Hills Regional Park (2,000 acres)
- Miesville Ravine Park Reserve (1,600 acres)
- Spring Lake Park Reserve (1,100 acres)
- Thompson County Park (57 acres)
- Whitetail Woods Regional Park (456 acres)
- Dakota Woods Dog Park (16 acres)



Restored Blufftop Prairie, Miesville Ravine

D. Dakota County Regional Greenways

Dakota County envisions a 200-mile multi-purpose, regional greenway system. Per the Metropolitan Council, Regional Trails "are intended to provide recreational travel along linear pathways. They are selected to pass through, or provide access to, elements in the regional park system and to intersect with local trail systems." Dakota County classifies its greenway corridors as urban (100 feet wide), suburban (200 feet wide), and rural (300 feet wide).

In addition to providing recreational and health benefits, greenways can link natural areas,

providing the opportunity for species to move in a degraded and habitat-poor landscape.

Greenways pose management challenges, as well, because in addition to providing habitat and connectivity services, they can also facilitate the movement of exotic and invasive species. The greenway system includes many natural areas that could be connected and enhanced, depending on greenway width.

Functioning like a linear park, greenways can be designed to improve water quality and wildlife habitat. Properly designed and managed, they can avoid problems like spread of invasive plants and small animal fatalities. Greenway management is complex and requires close collaboration among many municipalities and landowners.

Existing Dakota County Greenways

- Minnesota River (16.0 miles)
- Mississippi River (36 miles)
- River to River (8.4 miles)
- Lebanon Hills (8.5 miles)
- Lake Marion (20 miles)
- Vermillion Highlands (11 miles)
- Veterans Memorial Greenway (5 miles)

E. Dakota County Park Conservation Areas (CPCA)

The County owns nine CPCAs, totaling 356 acres of high-quality habitat. The CPCAs are not yet named.

F. Dakota County Land Protection

Natural area easements (58, totaling 2,042 acres)

Agricultural easements (71, totaling 7,812 acres)

Fee Title purchase with other public entities (33, totaling 2,396 acres)



View from Mississippi River Greenway, Swing Bridge Pier



CPCA on Vermillion River South Creek



Pine Bend Bluffs, Purchased with the State

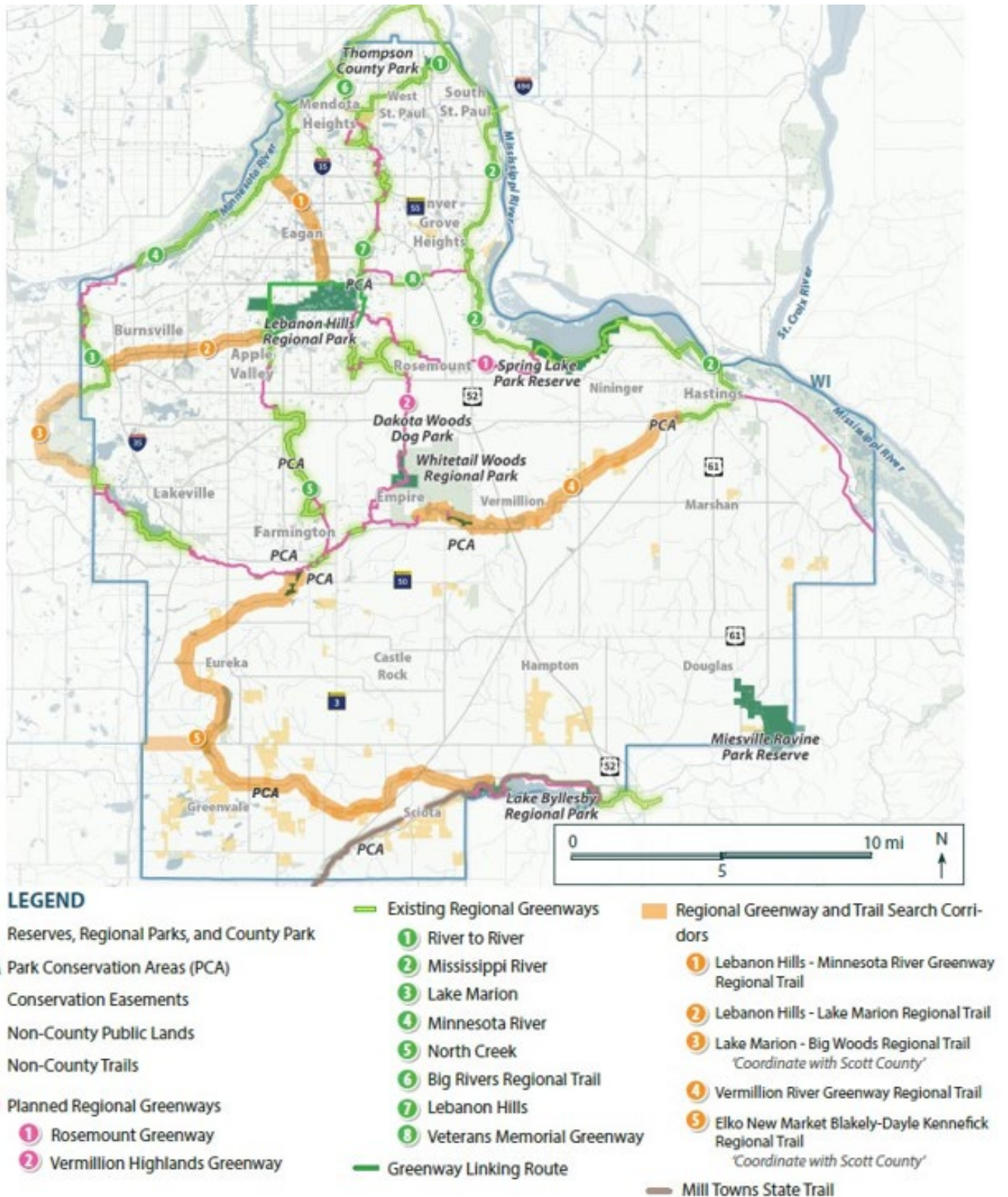


Figure 9: Protected Natural Lands in Dakota County

5. Trends Since the Last Plan

Several trends and factors informed the direction of this plan, including:

- Many lessons learned from implementing the 2017 Parks Natural Resources Management System Plan and the 2020 Land Conservation Plan
- Increased County commitment to ecological restoration and restoring the foundations of healthy natural systems
- Expansion of Parks Natural Resources' core services into adjacent areas, including projects at County service centers, libraries, and transportation projects
- Population growth and a substantial increase in parks visitation
- Continued public concern for loss of natural systems
- Growing public interest in reintroduction of native species
- Growing public concern about climate impacts
- Fiscal constraints and increased need for stable funding and grants
- Significant cost increases for labor due to updated prevailing wage laws in Minnesota
- Doing more work with more partners and other departments
- New technologies and methods, such as forest mowing, biochar, drones, and AI
- Greater interest in Indigenous connections and partnerships
- Identification of many rare plant and animal species in the Dakota County Park System
- Growing natural resource volunteer participation, increased by more than 90% between 2018 and 2025.

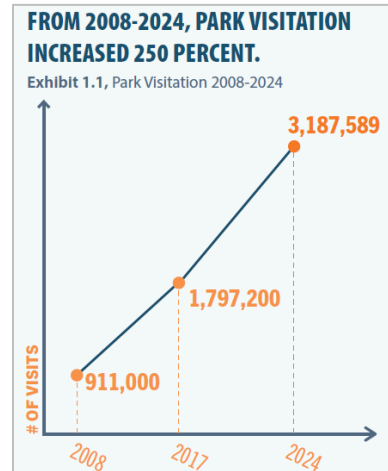


Figure 10: Increase in Dakota County Park Visitation



Biochar Kiln at Lake Byllesby



Rose Pogonia Orchid in a Dakota County Park

Chapter 2: Vision, Goals, and Actions

1. Framework

Goals and strategies from the **2050 Parks Vision Plan** provide overarching guidance to this Natural Systems Plan. The Vision Plan identified major desired outcomes, such as improved ecological functioning of county-managed lands. This NSP includes the next levels of actions (objectives, strategies, and tactics) for land protection and stewardship in a comprehensive framework that will guide natural systems management over the next 10 years.

2. Vision Plan Guidance

The NSP is guided by the following core values, goals, and strategies from the 2050 Parks Vision Plan.

A. Core Values

The Vision Plan core values are interrelated, emphasizing enriched connections between people and nature beyond simple co-existence. The Vision Plan is about reinforcing these relationships for mutual benefit, using public open space as a primary platform. This is integral to the role of Dakota County Parks as a nature-based park system.

The Natural Systems Plan focuses on protection and improvement of natural systems, the foundation for protecting our natural legacy as well as the foundation of a rich visitor experience.

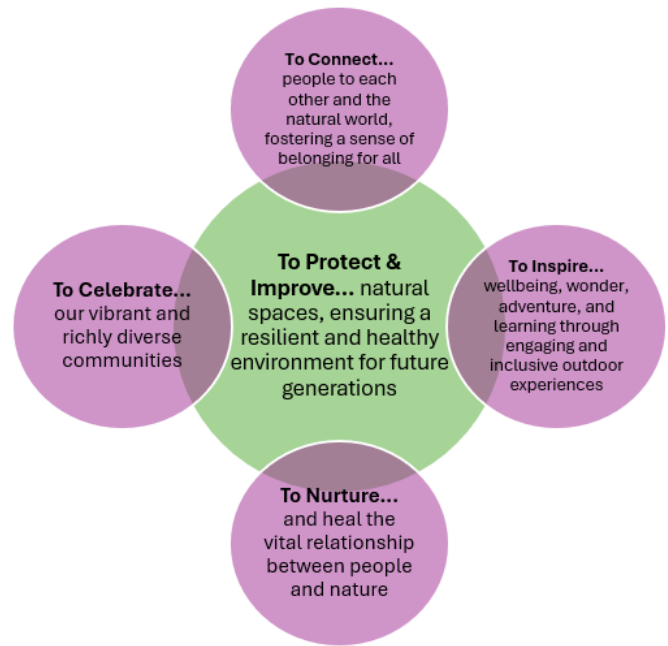


Figure 11: 2050 Vision Plan Core Values

B. Goals and Strategies for Natural Resources Protection and Management:

The 2050 Dakota County Parks Vision Plan includes 15 major goals that set the stage for the future of the park system as well as the three operational plans and individual unit plans. The following goals and strategies provide strong guidance on protection and stewardship of natural systems, with the first three goals forming the core of this plan.

Goal: Nurture the reciprocal relationship between people and nature.

- Maintain impactful land conservation, visitor services, and natural resource management plans.
- Commit to systematic care, management, and enhancement of lands across the system.

Goal: Lead and support on ecological stewardship and climate resilience.

- Develop and maintain a system wide approach to identify, protect, connect, improve, and manage landscapes. Regularly update this approach based on data and best practices and integrate into long range plans.
- Develop climate adaptation and mitigation strategies and resilient restoration practices.
- Continually innovate reduced environmental impacts of park development, programming, and operations.
- Prioritize habitat in environmentally sensitive areas.
- Be a cooperative platform, providing technical support to other's protection efforts.
- Reduce the park system's carbon footprint.
- Use preliminary Conservation Focus Areas (CFAs) as a framework for protecting and connecting natural areas and habitat.
- Continually assess new environmental threats and plan for responsive actions.
- Assess cumulative effects and impacts on natural systems when planning new development and improvements in parks, greenways, and conservation areas. Minimize, mitigate, or prevent impacts.
- Develop a process and criteria for identifying and designating resource-sensitive areas where special management or limited access may be needed to protect resources or sites.



Spring Lake Park Reserve

Goal: Protect, improve, and manage the natural resources of Dakota County.

- Use Conservation Focus Areas (CFAs):
 - a. As a landowner discussion framework for protecting and connecting natural areas.
 - b. To prioritize, protect, and restore surface/ ground waters and reduce flooding.
 - c. To protect critical habitat on public and private lands.
 - d. To provide compatible and appropriate outdoor recreation activities.
- Partner with watershed organizations and others to promote, incentivize, and implement water management and soil health practices in agricultural areas.
- Protect and restore critical infiltration areas outside CFAs identified by the County Groundwater Plan.
- Develop and implement a Pollinator Habitat Network.
- Provide timely Land Conservation Program information.
- Implement the Dakota County Land Conservation Plan and support implementation of the Dakota County Ground Water Plan
- Restore and manage natural spaces to support and nurture wildlife and plant communities.

Goal: Expand environmental stewardship through outdoor programs, learning, and volunteerism.

- Offer year-round program and volunteer opportunities.
- Partner with cities, schools, libraries, and other organizations to advance environmental learning and connection to career pathways.

Goal: Strengthen partnerships with Tribal Nations and Indigenous communities for the protection of lands and traditions.

- Employ Indigenous experts for teaching and planning and apply Traditional Ecological Knowledge (TEK) that stewards healthy water and land.



County Park Conservation Area

Goal: Locate new park units close to people and additionally, to protect natural areas and recreational assets.

- Protect park land and greenway corridors ahead of development pressure.
- Collaborate with local communities and partner organizations toward establishing new parks, greenways, and bridging facilities.
- Employ land protection tools to conserve shorelines and sensitive landscapes.

Goal: Seek values-based and mission-driven partnerships.

- Partner with state and federal agencies to improve parks/sites with state and federal significance.
- Partner with private landowners on conservation and land management.

Goal: Create dynamic spaces with unique and memorable experiences.

- Offer nature-immersion experiences in all seasons and in extraordinary natural landscapes.
- Encourage volunteerism to restore natural resources and build a conservation ethos.

Goal: Care for a system through sustainable and innovative funding.

Goal: Invest in a thriving parks workforce that represents the communities served.

- Collaborate with schools and professional organizations to elevate park and natural resource career pathways.
- Invest in youth programs, outdoor education, mentorship, and training that supports pathways to outdoor careers and future workforce diversity.

3. Land Protection

This section applies to the protection of land for ecological benefits, including the County Park System (parks, reserves, greenways, and park conservation areas), private conservation easements, and remaining natural areas.

Preliminary Conservation Focus Areas (CFAs) encompass priority areas for land protection and were based on the combination of natural features, connectivity, hydrology, and land use. The 24 Preliminary CFAs total 74,863 acres, of which 32,521 acres are protected and 42,342 acres are not protected.

These preliminary CFAs provide a framework for landowner outreach, collaborative landscape conservation and public investments. The preliminary CFAs refine and reduce the extent of eligible areas originally identified in the 2002 Farmland and Natural Area Protection Plan.

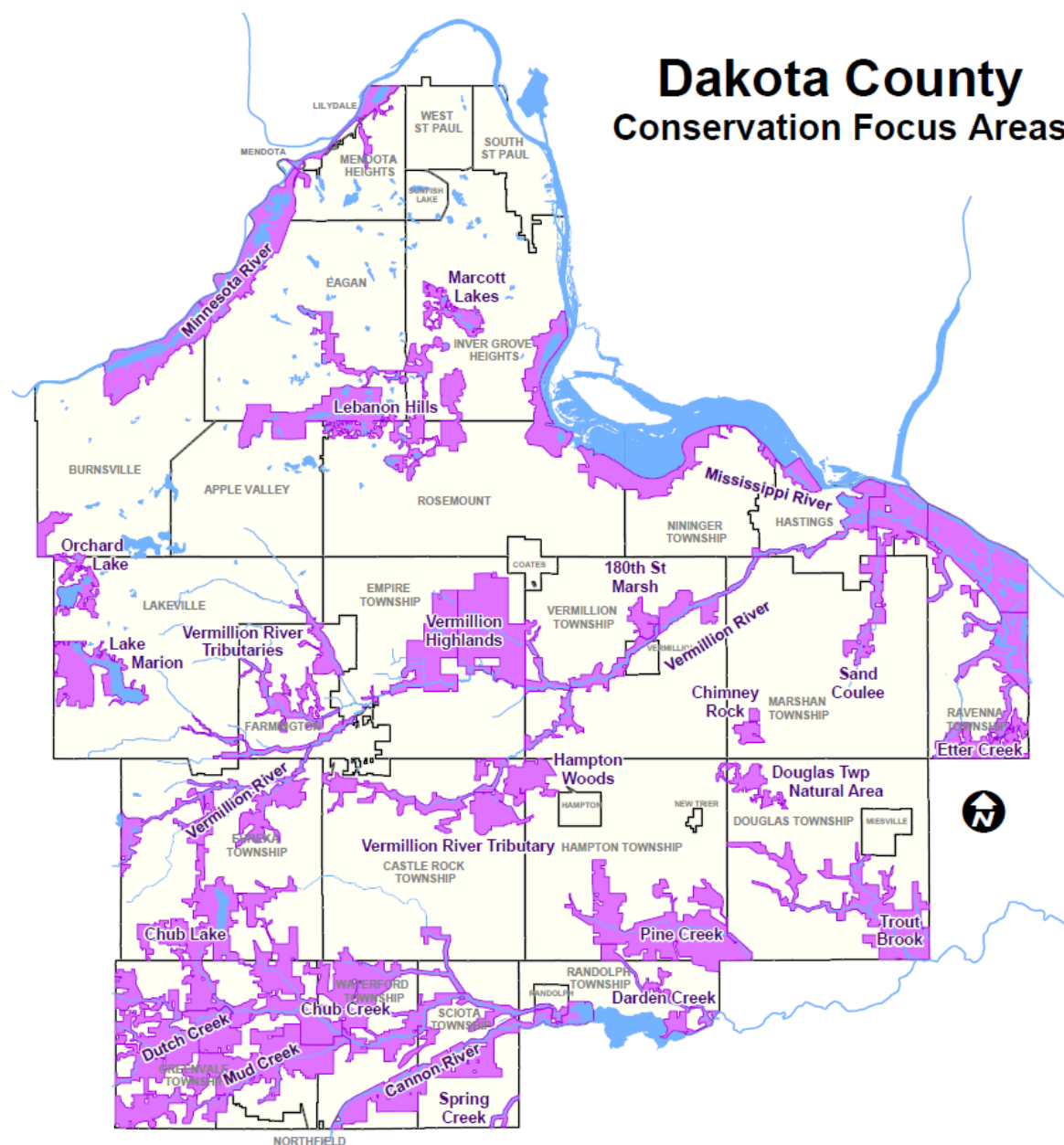


Figure 12: Dakota County Preliminary Conservation Focus Areas

The **Vision Plan** goals related to land protection are:

- Locate new park units close to people and to protect natural areas and recreational assets. (Goal H)
- Protect, improve, and manage the natural resources of Dakota County. (Goal J)

A. Land Protection Objectives and Strategies

The following actions define the County's approach to protecting lands based on natural qualities, the existing County Park System, and the concept of interconnected preliminary Conservation Focus Areas.

Objective LP1. Prioritize ecologically important areas for protection.

Strategy LP1a. Use County Park and Greenway Plans to guide park land and greenway corridor acquisition.

Tactics:

- i. Work with willing sellers to acquire fee title lands within approved park boundaries
- ii. Conduct regular outreach to landowners to inform them of opportunities to sell park inholding property to Dakota County.
- iii. Work with willing landowners along greenway corridors to secure easements for greenway development, enhancement, and management.

Strategy LP1b Use County Park and Greenway Plans and Conservation Focus Areas (CFAs) as a framework for protecting and connecting natural areas and habitat.

Tactics:

- i. Refine and periodically update acquisition project evaluation criteria and weighting for different classifications (surface water, wetland and adjacent habitat, upland and mixed upland habitat) to prioritize potential land protection projects.
- ii. Conduct landowner outreach within prioritized CFAs to effectively inform and engage landowners.
- iii. Create detailed, baseline information profiles for each CFA to document natural resource attributes, quality, needs, and opportunities with evolving updates.
- iv. Prioritize identified wetland basins for landowner outreach and further hydrological analysis and cost estimates.
- v. Use a range of voluntary land protection methods, such as fee title and easement acquisition and land registry.
- vi. Protect representative, high-quality native communities (wetlands, grasslands and forests) within the County.
- vii. Establish a technical advisory group to evaluate and develop recommendations for the use of property tax modifications as conservation incentives.
- viii. Review CFA boundaries every five years and revise as needed, based on new information.
- ix. Define and periodically reevaluate Greenway Corridor widths (100 ft Urban, 200ft Suburban, or 300 ft Rural contexts) beyond County easements to:
 - Prioritize partnership work with landowners on native habitat buffers and restoration priorities for connecting habitat corridors along Greenway Trails and
 - incentivize larger restoration efforts on non-County public lands.

Objective LP2. Protect and enhance water quality and quantity.

Strategy LP2a. Use preliminary CFAs to identify, prioritize, protect, and restore wetland basins, shoreland, headwaters, and groundwater recharge areas to improve water quality and supply and to reduce flooding.

Tactics:

- i. Review and revise evaluation criteria and weighting as needed to prioritize potential protection and restoration projects.
- ii. Conduct landowner outreach within prioritized CFAs to effectively inform and engage landowners.
- iii. Use a range of voluntary land protection methods, such as fee title and easement acquisition and explore options for long-term agreements.
- iv. Consider developing strategies in partnership with stakeholder organizations to engage with existing agricultural easement landowners to incentivize the adoption of additional conservation practices on existing agricultural easements.

Strategy LP2b. Protect and restore critical infiltration areas and Drinking Water Supply Management Areas (DWSMAs) outside CFAs, as identified in the County Groundwater Plan.

Tactics:

- i. Establish evaluation criteria and weighting to prioritize potential protection and restoration projects.
- ii. Conduct landowner outreach in other important areas to inform and engage landowners and initiate wetland restoration.
- iii. Use a range of voluntary land protection methods, such as fee title and permanent or temporary easements.

Objective LP3. Use CFAs as a framework for restoring and sustaining biodiversity.

Strategy LP3a. Use CFAs to identify and prioritize habitat protection for rare, declining, and special concern species on public lands.

Tactics:

- i. Identify and inventory areas of existing high biodiversity and high restoration potential.
- ii. Develop baseline biodiversity data, goals, priorities, and monitoring protocols for the County and each CFA.

Strategy LP3b. Use CFAs to identify and protect habitat for rare, declining, and special concern species on private lands.

Tactic:

- i. Prioritize biodiversity in CFA protection and restoration criteria, weighting, and implementation.

Objective LP4. Enhance nature-based recreational access to conservation lands.

Strategy LP4a. Add new publicly accessible recreational lands within CFAs.

Tactics:

- i. Work with landowners and partners to add and/or expand publicly accessible land within each CFA.
- ii. Inventory and select multiple countywide locations for the public to experience high quality, representative wetland, grassland and forest communities.

- iii. Develop a baseline amenity package for conservation lands that are passive in nature and require minimal operation and maintenance inputs.
- iv. Work with partners to provide natural resource information for outdoor recreation participants through multiple venues and methods.

4. Natural Systems Stewardship

This section discusses stewardship and management of natural systems within and outside of the County Park system. The primary related Vision Plan goals are:

- Nurture the reciprocal relationship between people and nature. (Goal A)
- Lead and support on ecological stewardship and climate resilience. (Goal I)
- Protect, improve, and manage the natural resources of Dakota County. (Goal J)

Foundations of Natural Resources Management

- Natural communities exist as interrelated, dynamic ecosystems that have developed over thousands of years, and are not confined to jurisdictional or property boundaries.
- Natural resources have intrinsic value in addition to the multiple ecosystem services and public benefits they provide.
- Biodiversity is an important measure of site quality, resilience, and biotic potential.
- Larger, contiguous habitat areas often provide more ecological benefits than smaller or linear areas, and connectivity between habitat areas allows for plant and wildlife movement that maintains the genetic health of breeding populations.
- Natural habitats and processes have been significantly lost, fragmented, degraded and disrupted, resulting in diminished function, long-term viability, and reduced benefits.
- Natural resource management is a process necessary to reverse degradation to natural systems and requires long-term commitment, often with no clear endpoint.
- Natural processes (fire, flooding, apex predation, etc.) that have kept natural communities resilient have been eliminated or altered. Active management to substitute for natural processes is essential to restore the diversity of life that defines these communities.
- Natural resource management should strive to improve and sustain complex interrelated natural systems, especially for rare and declining native species.
- Natural resource management should address historic, current and adjacent land uses.
- Natural resource management requires an acknowledgement of recreational use/development while pursuing ecological restoration, recognizing that human presence and activities constitute a disturbance to many sensitive native and desired species that needs to be mitigated.
- Natural resource management on protected private lands improves resource quality, contributes to landscape connectivity, and provides public benefits.
- Healthy natural systems provide mental and physical health benefits to people, strengthen our connections to nature, enhance outdoor experiences, and deepen relationships among cultures and for cultures that experience spirituality in nature.
- Consistent, ongoing investment and staffing support is necessary to sustain the health, integrity, and productivity of these living systems.
- The precautionary principle should be applied in projects that could degrade natural resources. If the consequences could be serious even with scientific uncertainties, precautionary measures should be used, or the project should not be undertaken.

Natural Resources Vision

The water, vegetation, and wildlife of Dakota County parks, greenways, and easements will be managed to increase and conserve biodiversity, restore native habitats, improve public benefits, and achieve resilience and regionally outstanding quality, now and for future generations.

A. Natural Systems Management Objectives and Strategies

These objectives and strategies enable the work of natural systems management on a yearly basis and improve staff ability to work with others, without being overly prescriptive. They provide direction in the space between the high-level goals of the 2050 Vision Plan and the individual unit NRMPs.

These objectives and strategies also serve to clarify County role and its need to engage other resource management agencies and landowners to a greater extent. The first objective begins by defining an overarching approach grounded in the concept of Adaptive Management, an ongoing cycle of investment, planning, implementing, monitoring, and adapting. This approach allows for adjustment in approaches based on real results.

Objective NS1. Manage natural systems on protected lands in a comprehensive and sustainable manner.

Strategy NS1a. Invest: Commit to natural systems restoration and perpetual maintenance.

Tactics:

- i. Periodically review restoration target acreages with Board requests for funding and staff resources to improve the long-term integrity of natural systems, increasing resources as the system grows.
- ii. To protect the ecological and financial investment in the acres restored, secure stable funding for long-term adaptive management.
- iii. Build and sustain partnerships with cities, SWCD, state, federal, tribes, non-profit organizations, landowners, volunteers, community members, and others.
- iv. Provide staff training to ensure that state of the art natural resource management techniques and technologies are utilized.

- v. Continue requiring ongoing restoration, management and maintenance activities as part of land protection easement agreements.
- vi. Explore options for a private funding entity to secure and disburse private funds for natural resource restoration and maintenance on protected private lands.



Figure 13: Adaptive Management Cycle

Strategy NS1b. Plan: Develop a coordinated, science-based framework that guides natural resources management across all parks, greenways and easements.

Tactics:

- i. Base management plans in sound ecological science incorporating goals that align with site conditions and ecology, planned site uses, available resources, and projected climate change effects. Make reasonable plans to avoid conflicts between site use and ecological needs.

- ii. Designate selected areas within the park system that have higher natural resource quality, unique habitat value, rare species, restored areas, or areas with sensitive cultural resources as places where the priority use and management will be to protect, improve, and maintain resource integrity. Limit recreational use and access in areas with the most sensitive resources on a temporary or permanent basis.
- iii. Identify and adhere to standards for desired restoration outcomes that reflect ecological context, intensity of site uses, and potential climate impacts.
- iv. Develop individual and prioritized natural resource management plans (NRMP) for each park, greenway, and easement being managed, and update plans regularly.
- v. Integrate priorities across individual NRMPs into system-wide priorities.
- vi. Engage partners, landowners, stakeholders, and experts in scoping and planning initiatives.
- vii. Apply the CFA framework and data from individual NRMPs to establish criteria and weighting for project prioritization, ensuring site-level priorities integrate into a coordinated, system-wide strategy.
- viii. Identify a consistent and secure, long term funding source for natural resource work.
- ix. Incorporate findings from culturally sensitive landscape plans into natural systems management practices.

Strategy NS1c. Implement: Implement plans in accordance with the principles of natural systems management and the 2050 Vision Plan.

Tactics:

- i. Base plan implementation in sound ecological science and established priorities for the system.
- ii. Develop workplans that adhere to the Adaptive Management principle of maintaining flexibility to address emerging issues and opportunities.
- iii. Continue implementing the City-County Conservation Collaborative to increase natural resource management within ecologically significant city lands using shared and leveraged resources.
- iv. Stay up to date on the latest implementation technologies and techniques.

Strategy NS1d. Monitor: Utilize a coordinated, science-based framework to monitor work progress and natural system change over time.

Tactics:

- i. Monitor vegetation, water and wildlife to track natural system change using a well-designed system that can be sustained over time.
- ii. Use disease monitoring and Invasive Species Early Detection monitoring protocols to track and respond to emergent issues.

Strategy NS1e. Adapt: Learn from project outcomes and monitoring results and adjust implementation strategies accordingly.

Tactics:

- i. Refine and improve management approaches based on adaptive management principles and lessons learned.
- ii. Create opportunities to test new resource management approaches.
- iii. Incorporate flexibility in plans to account for unforeseen changes and opportunities.

- iv. Continually revisit and refine programs, including cost share funding formulae.

Objective NS2. Manage natural systems to mitigate and improve resilience to the impacts of a changing climate.

Strategy NS2a. Strengthen ecosystem diversity and health to withstand climate impacts.

Tactics:

- i. Maintain and restore diverse natural communities that can better withstand extreme temperatures, severe storm events, drought, and the influx of new pests and diseases from other climate zones.
- ii. Increase species diversity as a critical element of climate resilience.

Strategy NS2b. Use adaptive, science-based practices to prepare for future conditions.

Tactics:

- i. When supported by science, explore the use of assisted migration methods to carefully introduce selected species that are native to warmer climate zones.
- ii. Monitor species used in assisted migration to track efficacy of the approach and species used.
- iii. Apply emerging research to anticipate and manage ecological changes linked to climate trends.

Strategy NS2c. Increase carbon sequestration within the system and in other areas of opportunity.

Tactics:

- i. Restore diverse native communities that sequester carbon, including grasslands and woodlands.
- ii. Maintain the health of native communities to reduce loss of sequestration capacity.
- iii. Work with and advise other County departments and partners to increase ecologically appropriate and diverse tree and vegetative plantings as a cooling and carbon sequestration mechanism in targeted locations.

Strategy NS2d. Reduce the carbon footprint of management activities.

Tactics:

- i. Reduce emissions from restoration and maintenance work through practices such as using biochar in lieu of burning wood and evaluate additional opportunities for more sustainable management of wood waste.
- ii. Transition maintenance equipment and operations toward electric or low-emission alternatives when feasible.

Objective NS3. Improve ecological quality in County Parks, on other public lands and permanently protected private lands.

Strategy NS3a. Restore, enhance, and maintain vegetative natural systems on County-owned public lands.

Tactics:

- i. Enhance ecological functioning in targeted restorations with the addition of selected native species.
- ii. Propagate local native ecotypes for vegetation restoration projects

- iii. Where true ecological restoration is not possible but other public benefits are achievable, develop native landscaping projects with educational and targeted ecological benefits, such as pollinator gardens, raingardens, and native plantings.

Strategy NS3b. Restore, enhance, and maintain natural resources on non-County public lands.

Tactics:

- i. Use the CFA framework to develop criteria and weighting for prioritizing potential natural resource management projects within CFAs.
- ii. Review funding formulas for restoration projects on public lands within and outside of CFAs.

Strategy NS3c. Restore, enhance, and maintain natural resources on protected private lands.

Tactics:

- i. Provide new incentives for improved natural resource management on protected and non-protected private lands.

Strategy NS3d. Identify natural system management gaps not addressed through County lands, other public protected lands, and permanently protected private lands.

Tactics:

- i. Consider refinements to the Conservation Focus Areas as new information becomes available and additional opportunities arise for stewardship of sensitive natural resource lands.
- ii. Consider opportunities to assist other private property managers in managing natural systems on their lands.

Objective NS4. Manage permanently protected land to improve surface and groundwater quality.

Strategy NS4a. Work with partners to address surface water quality issues in County Parks based on lakes study and collected data.

Tactics:

- i. Inventory water quality for lakes, river, streams, and wetlands to identify trends over time and priorities for improvement.
- ii. Develop an adaptive lake(s) management plan for County parks that contain lakes/wetlands.
- iii. Work with partners to address the most significant aquatic invasive species (AIS) and the most significant wetland invasive species.
- iv. Work with partners to install stormwater best practices at priority locations in park watersheds within and outside of park boundaries to address impairments (e.g., sand-iron filters, infiltration basins, settling ponds)

Strategy NS4b. Use a range of natural resource management techniques within and outside of CFAs to restore, enhance and maintain lands for improved water quality, infiltration, and storage to reduce flooding and provide wildlife habitat benefits.

Strategy NS4c. Partner with the SWCD and watershed organizations to promote, incentivize and implement water quality and quantity management and and soil health Best Management Practices in agricultural areas within or outside of CFAs (e.g., functional buffers, perennial vegetation on critical recharge areas, erosion control, wetland restoration, water retention basins).

Tactics:

- i. Review existing programs to determine if there are gaps or new opportunities and develop and implementation plan.
- ii. Secure new cost-share funding for best management practice (BMP) implementation.
- iii. Promote awareness of BMP opportunities among landowners and operators.
- iv. Leverage financial and staff resources to implement projects on protected lands.

Objective NS5. Manage habitat to sustain native and rare species, increase biodiversity, and enhance ecosystem health on permanently protected lands.

Strategy NS5a. Monitor and manage wildlife populations to sustain ecological balance and support adaptive management.

Tactics:

- i. Monitor selected resident and migratory species (short- and long-term) to track progress, evaluate ecosystem health, and inform wildlife population management practices and priorities.
- ii. Monitor rare plant and wildlife species to track changes in local populations.
- iii. Control overabundant species that negatively impact natural systems.
- iv. Seek opportunities for the reintroduction of appropriate native wildlife species in coordination with regional and state partners.
- v. Manage the Spring Lake Park Reserve Bison herd to sustain their health and provide ecological and cultural benefits within their range.

Strategy NS5b. Enhance habitat connectivity and wildlife movement across the landscape.

Tactics:

- i. Enhance wildlife movement corridors in greenways, parks, and adjacent lands to maintain population genetic diversity and resilience.
- ii. Partner with the MN DNR, adjacent jurisdictions, and others on regional wildlife habitat and connectivity.
- iii. Continue to identify road areas adjacent to key wildlife habitat that have higher wildlife mortality for improved wildlife crossings.
- iv. Identify and remove barriers to wildlife movement, prioritizing locations with high ecological or connectivity value.

5. Program Operations

The following objectives inform how the County's Natural Resources Unit will conduct its operations to build relationships, optimize its efficiency and effectiveness, make best use of limited funding, and remain accountable to the public and partners.

Related Vision Plan Goals:

- Cultivate belonging by engaging and serving the community, with an emphasis on those who are under-represented in the outdoors. (Goal B)
- Expand environmental stewardship through outdoor programs, learning, and volunteerism. (Goal E)
- Strengthen partnerships with Tribal Nations and Indigenous communities for the protection of lands and traditions. (Goal G)
- Seek values-based and mission-driven partnerships. (Goal L)
- Care for the system through sustainable and innovative funding. (Goal M)
- Invest in a thriving parks workforce that represents the communities served. (Goal N)

B. Partnership Objectives and Strategies

Objective OP1. Expand capacity for natural systems management by building and sustaining effective partnerships and supporting the efforts of others.

Strategy OP1a. Build enduring partnerships to share expertise and resources.

Tactics:

- i. Create and foster long-term partnerships with County departments, cities, tribes, state and federal agencies, and non-profit organizations to manage natural systems using a coordinated, systems-based approach.
- ii. Engage and learn from Indigenous partners and experts in Traditional Ecological Knowledge (TEK) to inform management practices.
- iii. Explore co-management opportunities with Tribal or Indigenous communities for areas that contain significant cultural and natural resources.
- iv. Strengthen and expand collaborative initiatives such as the City-County Conservation Collaborative and the Greenway Collaborative for planning, protection, and management.
- v. Partner with transportation agencies and utilities to improve pollinator habitat within right-of-way and corridors.
- vi. Partner with academic institutions and government agencies on research related to natural systems stewardship, including vegetation, water, and wildlife.

Strategy OP1b. Help increase the capacity of others to manage natural systems.

Tactics:

- i. Provide technical assistance, training, and educational resources for public and private landowners.
 - Support volunteer training, coordination, and ongoing engagement in restoration and monitoring.
 - Work with educational institutions, training programs, and organizations to build the natural systems management workforce.

- Evaluate and implement mechanisms—such as technical assistance, incentives, or cooperative programs—to help private landowners, corporations, and institutions manage land for ecological benefit.

C. Communications Objectives and Strategies

Objective OP2. Inform and engage the public on land protection.

Strategy OP2a. Provide timely and relevant Land Conservation Program information.

Tactics:

- i. Update the Land Conservation Communication Plan to provide a wide variety of information and stories to the general public throughout the year.
- ii. Provide environmental assessments for interested landowners.
- iii. Provide regular program updates and information to property owners with County easements information and two-way communication opportunities for participating landowners.

Objective OP3. Inform and engage the public on natural systems management.

Strategy OP3a. Deliver timely and relevant information to the public on natural systems stewardship activities.

Tactics:

- i. Develop a communication plan for the Natural Resources Program.
- ii. Provide information and periodic updates on specific restoration and maintenance projects and where practical, utilize field signage to explain projects that are visible to the public.
- iii. Periodically provide clear and easily understood status updates on natural resource management at a system level to the public and officials, using map products and other graphics to convey complex information.
- iv. Develop a collaborative, countywide, web-based network and interactive map to share natural resource information with the general public.
- v. Facilitate volunteer opportunities in partnership with other agencies and organizations (e.g., seed collection, invasive species control, and vegetation and wildlife monitoring).
- vi. Provide programs, workshops, and tours.

Strategy OP3b. Promote stewardship through outreach and education.

Tactics:

- i. Promote County parks as living classrooms and demonstration sites for restoration and stewardship best practices.
- ii. Share knowledge and lessons learned from County projects to inspire and inform partner, private landowner, and community stewardship efforts.
- iii. Provide safe foraging opportunities, through initiatives like an edible forest and propagation of culturally significant plants to help people better understand and promote the connections between themselves and the natural world.

D. Business Operations Objectives and Strategies

The following objectives and strategies address operational needs.

Objective OP4. Refine system-wide prioritization for annual and five-year workplans with criteria-based scoring.

Strategy OP4a. Ensure that workplans are prioritized, sustainable over time, and can be accomplished with expected staffing and funding.

Strategy OP4b. Include flexibility to account for unforeseen changes that pause or cancel projects, allowing for alternate projects to move forward.

Objective OP5. Develop and refine effective metrics to document system-wide and project-level progress.

Strategy OP5a. Refine metrics for reporting to elected officials, the public, and grant funders.

Tactics:

- i. Refine metrics to “tell the story” and provide overall status of the unit’s work (e.g., acres restored and managed, number of species pre- and post-restoration, value of the work, other).
- ii. Develop updatable findings to generate interest in and support for the work.
- iii. Use clear metrics and findings to encourage volunteer participation.

Strategy OP5b. Refine metrics to provide a feedback loop to adaptive management.

Tactics:

- i. Establish bioindicator species and quantitative vegetation metrics to determine quality thresholds for progress towards restoration goals.
- ii. Identify factors that influence outcomes, e.g., soils, terrain, weather, contractor performance.
- iii. Identify other long-range trends with impacts to restoration and ecological health, e.g., pests, diseases, climate impacts.

Strategy OP5c. Collect and analyze metrics to improve program operations, facilitate information-sharing, and expedite plan updates.

Tactics:

- i. Develop a land management database to track parks, greenways, and easements over time to identify obligations and agreements for the County, cities, landowners and other parties.
- ii. Develop cost data for different types of restoration and management projects over time.
- iii. Develop metrics on staff time needed for natural resource projects and tasks.
- iv. Track performance and outcomes of key programs (e.g., City-County Conservation Collaborative and Land Conservation).
- v. Track implementation of individual unit NRMPs.
- vi. Track workplan implementation quarterly and track NSP implementation annually.
- vii. Track grant funding over time.

Strategy OP5d. Evaluate methods to improve the efficiency and consistency of data collection and analysis.

Tactics:

- i. Expand the use of technology for data collection (e.g., drones, remote cameras, AI) as appropriate.
- ii. Consider the use of contracted or other services for data analysis, where appropriate.

Objective OP6. Develop a staffing structure to more effectively address system growth and needs.

- Strategy OP6a.** Consider a flexible staffing structure that can adapt over time as the system grows.
- Strategy OP6b.** Fill gaps in needed skills sets contingent on available budgets.
- Strategy OP6c.** Enhance coordination with partner departments and agencies to fill gaps in needed skills (e.g., Water Resources, Soil and Water Conservation District, watershed management organizations, and others).
- Strategy OP6d.** Develop staffing ratios to identify FTE needs as the system grows.
- Strategy OP6e.** Evaluate position classifications for project specialists that manage projects as part of routine Employee Relations Department processes.
- Strategy OP6f.** Implement the findings of the Office of Performance Analysis study related to temporary staffing.

Chapter 3: Implementation

The Dakota County Park system was established in 1971. In 2017, the County Board adopted the Natural Resources Management System Plan (NRMSP), which marked the beginning of a sustained effort to restore and manage natural resources in parks. During the intervening fifty years, natural areas in the growing Parks system continued to degrade ecologically. Former land uses, exotic invasive species, erosion, and suppression of natural processes that were integral to these natural communities combined to reduce species diversity, degrade habitat, impact sensitive cultural resources, and isolate populations of native plants and animals. In addition, many abandoned agricultural areas within the current parks' boundaries developed into novel ecosystems. A novel ecosystem is "a system of abiotic, biotic and social components (and their interactions) that, by virtue of human influence, differ from those that prevailed historically, having a tendency to self-organize, and manifest novel qualities without intensive human management."⁴ In other words, novel ecosystem "natural areas" within the parks are unprecedented in Minnesota's ecological history and pose a great management challenge as to restoration targets and approaches.

The NRMSP set the stage for reversing degradation and marked the beginning of large-scale restoration. All but one goal presented in the NRMSP was exceeded. Since 2017, 2,750 park system acres have been restored. During this time, staff also intensively surveyed the parks to document plants and wildlife, discovering many State-listed rare species. This is critical information in the natural resource restoration and adaptive management processes.

This chapter presents the model used for managing the natural communities in the park system. Prioritization, core services, project criteria and outcomes are also included

Implementation of this plan is subject to annual budget and Capital Improvement Program (CIP) approval by the County Board. Staff will develop annual workplans that build on the system vision and previous work, target high-priority projects, leverage external funding, and maintain restored lands.

1. Long-Term Management Model

This Plan has a clear vision for protecting, restoring, and maintaining County lands and private easements over the long term. As new lands are added to the system, whether through easements, new parkland, or greenway corridor projects, they require restoration and management to retain and improve their natural functions. The following graphic illustrates how land transitions from initial protection through restoration into its long-term adaptive management state. The goal of the program is to transition all lands into an ongoing adaptive management phase.

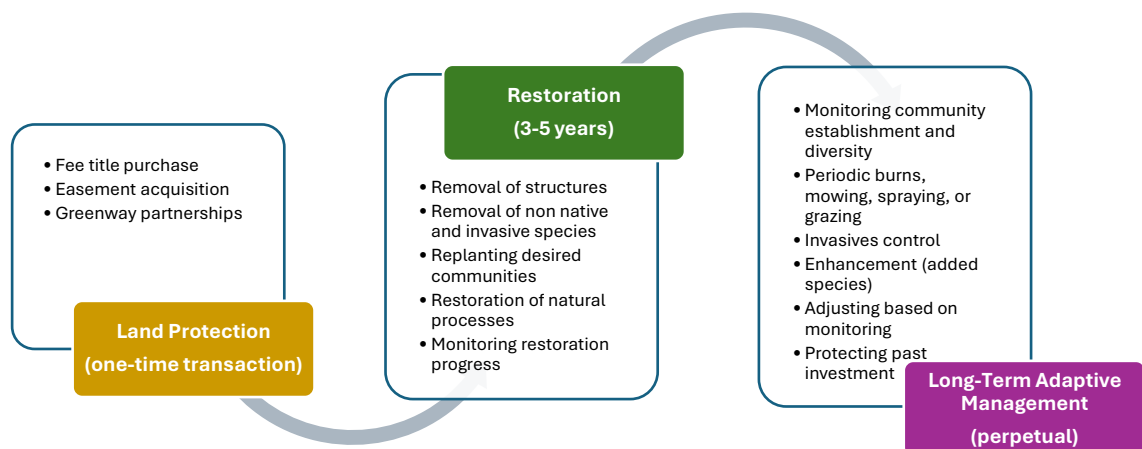


Figure 14: Idealized Path for Protection, Restoration, and Long-Term Management

⁴ Novel Ecosystems. Intervening in the New Ecological World Order by R.J. Hobbs, E.S. Higgs and C.M. Hall (2013), 380 pp., Wiley-Blackwell, Hoboken, USA. ISBN 978-1-118-35422-3

At any point in time, lands in the system are at different points in this progression and new lands are being added every year. The County has typically worked with willing sellers for park land acquisition and willing landowners for easement purchases. Greenway corridors involve a mix of fee title acquisition, easements, and partnerships with cities. Since 2020, more than 1,900 acres have been identified for restoration and management by five recent greenway NRMPs, which includes the standard greenway corridor widths plus additional partnership opportunities on public and private lands adjacent to greenways. New natural area easements will all require NRMPs. It is difficult to predict exactly how many new acres will be protected over the coming five and ten years, although it is almost certain that the system will grow.

A key question is how to set the pace of restoration, recognizing that:

- County park land historically was not restored or managed immediately upon acquisition. The County began acquiring parkland in 1967. While some natural resource activities were being done, it was not until the Natural Resource Management System Plan was adopted in 2017 that the County developed a formal Natural Resources Program. Almost half of the park system is not yet managed, consisting mostly of land retired from as much as a century of farming over the past 50-plus years. Furthermore, more acreage is added to the system each year.
- Once restored, lands should transition into perpetual long-term adaptive management, which will increase to become the largest management category. All lands that have been restored require long-term management to protect the previous investments of protection and restoration. While less costly and intensive than the restoration phase, long-term management is an ongoing responsibility.
- Different types of park units provide their own unique opportunities and challenges. County Parks, Reserves, and Regional Parks are under the ownership of Dakota County which has the sole responsibility and “rights” to plan, restore and maintain them. The greenway system, especially when promoting ecological maximization along the corridor, always must work with multi-jurisdictional goals, agreements and funding. In addition, Dakota County parks are large enough to minimize edge effect and promote core habitat. Greenways, on the other hand, are long, narrow corridors that are all edge and therefore present significant challenges when attempting to set specific goals and conduct restoration activities. Altered soil conditions, heavy and often persistent weed pressure, varying levels of contractor experience and increased costs combine to impact not only the pace of restoration but project success.



Figure 15: 1937 Aerial Photo with extensive farming in the Lebanon Hills area

While it may make ecological sense to restore all unmanaged acres as quickly as possible, several fundamental drivers influence the pace of transitioning lands from protected but unmanaged, to restoration, and to long-term adaptive management, including:

1. Costs at each phase:

- Acquisition costs (\$2,250-\$40,000 per acre for easements, up to \$127,000 per acre for inholdings)
- Restoration cost (\$4,300 to \$65,000 per acre depending on access, terrain, habitat type). These costs have increased substantially due to the requirement to pay prevailing wages for State-funded projects.
- Long-term adaptive management costs (average of \$290 per acre)

2. Funding availability for each phase:

- Acquisition sources (outside funding available with County match)
- Restoration funding sources (outside funding available with 10-25% County match)
- Long-term adaptive management funding sources (typically has been County-funded)

3. Staff capacity to manage new projects:

- Staff currently manage restoration, management, and reintroduction projects; coordinate partnership efforts, conduct plant and animal surveys and monitoring; and coordinate volunteer events
- Staff additionally participate in non-NRMP park and greenway plans, to add perspective on ecological considerations
- New management units/projects being added to the system via NRMPs, greenways, projects at non-park County buildings, and smaller restoration projects added in conjunction with major park developments.

Some acquisition and restoration funds are available from outside sources, while funding for long-term adaptive management often has been the responsibility of the County. The number of acres in long-term adaptive management is expected to increase over the next decade, going from roughly 2,750 acres today to more than 4,000 acres. Securing stable funding for the long-term adaptive management work will be imperative to protect the investments made in land protection and restoration.

At a system level, different approaches could be used to plan workloads related to anticipated budgets, funding, and staffing levels. The following example graph demonstrates a hypothetical management approach for park lands based on holding the number of acres in active restoration relatively constant over time, at 400 to 500 acres. In this example, about 200 acres of unmanaged or minimally managed unrestored lands enter active restoration every two years and a similar number of the acres in restoration “graduate” into a long-term management regime. Over a ten-year period, nearly 40 percent of the lands currently not being managed or undergoing minimal management would be either in active restoration or in long-term adaptive management. All unmanaged park lands would have entered restoration by 2050, 24 years from now. This timeline could be accelerated by increasing the number of acres being restored each year, contingent on available funding and staff capacity. An alternative strategy would be to slow down the pace of restoration to ensure that acres already restored can be properly managed.

Note that the following hypothetical model does not reflect new lands being added to the system. It also includes only park acres – not greenways, easements, or city-county collaborative lands.

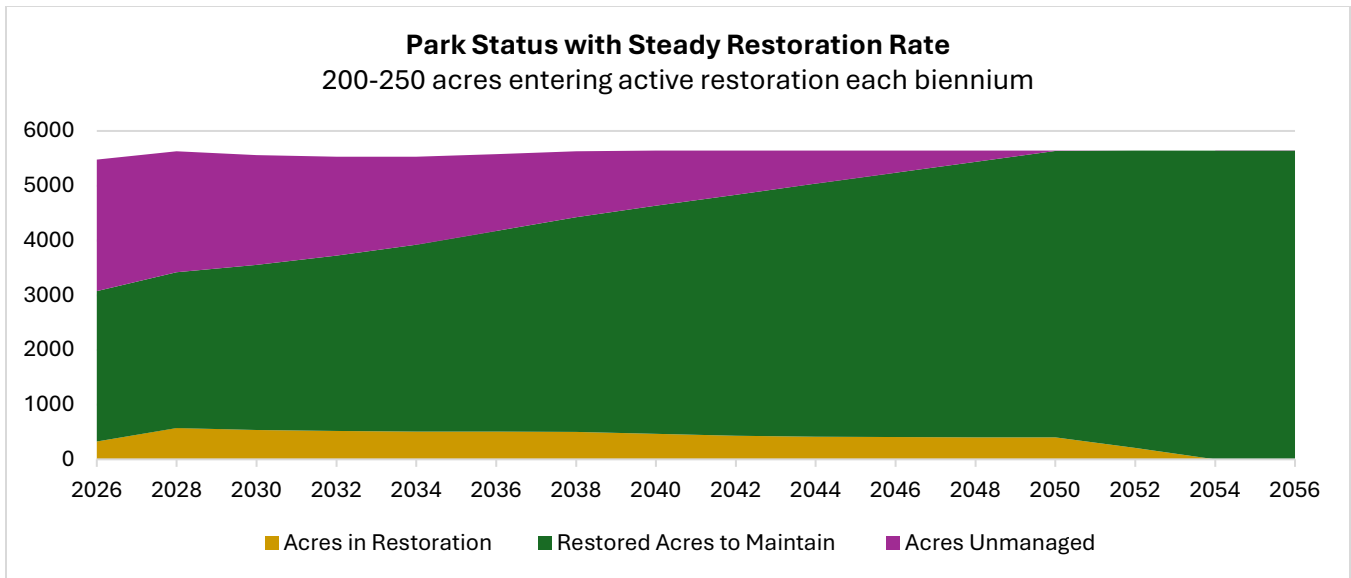


Figure 16: Management Model Holding the Number of Acres Entering Restoration Constant

The following example chart shows costs associated with a model that holds the number of park acres entering restoration staying relatively constant over time. For illustration purposes only, maintenance costs of \$600/acre/biennium and restoration costs of \$20,000/acre/biennium were used. The graph shows the full restoration cost (magenta line), and the share that the County historically has paid through a local match (gold line, currently 10-25 percent of restoration costs). Park restoration work would end in about 2054, with all lands restored and transitioning into long-term adaptive management with steadily increasing costs (green line).

Note: No inflationary increases were applied, although they can be considerable over time. Because more of the readily accessible and more easily restorable lands within parks already have been restored, costs are likely to increase for the more challenging new projects that remain.

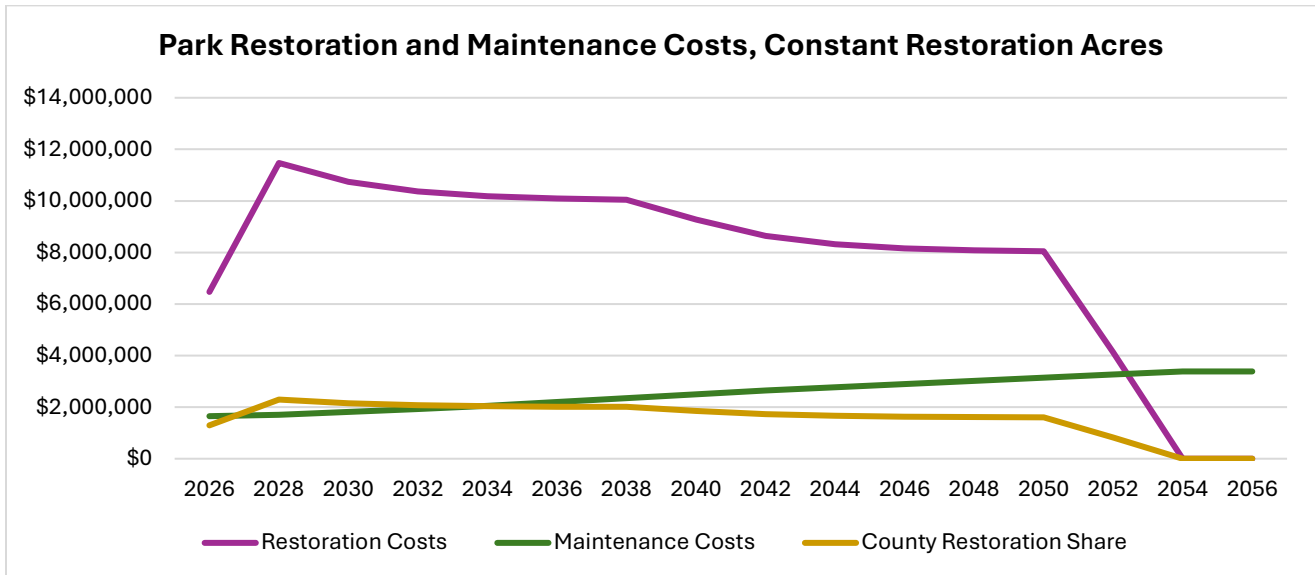


Figure 17: Costs - Actual Restoration, County Restoration Share, and Long-Term Management

This approach can be varied to change the pace of restoration, based on staff capacity, anticipated external funding and County budgets, and overall costs.

2. Core Services

Identification of core services and expanded services can help guide operational planning and can play a role in prioritization. This plan uses the following definitions to categorize services provided by the Parks Natural Resources unit. Typical time allocations are indicated for each service class.

Service	Percentage of Work
Core Services include essential work that is driven by a clear mission, is expected, and should continue.	70%
Adjacent Services typically involve expansion of existing skills/activities to new types of work that is consistent with the mission. These services can become core if the effort is successful, and work must be continued to preserve investments made in launching the effort.	20%
Transformational Services are new services that can require the development and use of new skill sets. These are “breakthrough” efforts addressing newly identified needs or opportunities that expand capabilities within the mission. Transformational services can become core services if the effort is successful, and work must be continued to preserve investments made in launching the effort.	10%

Figure 18: Table Defining Core, Adjacent, and Transformational Services

The following diagram shows the Natural Resources Unit’s core, adjacent, and transformative services.

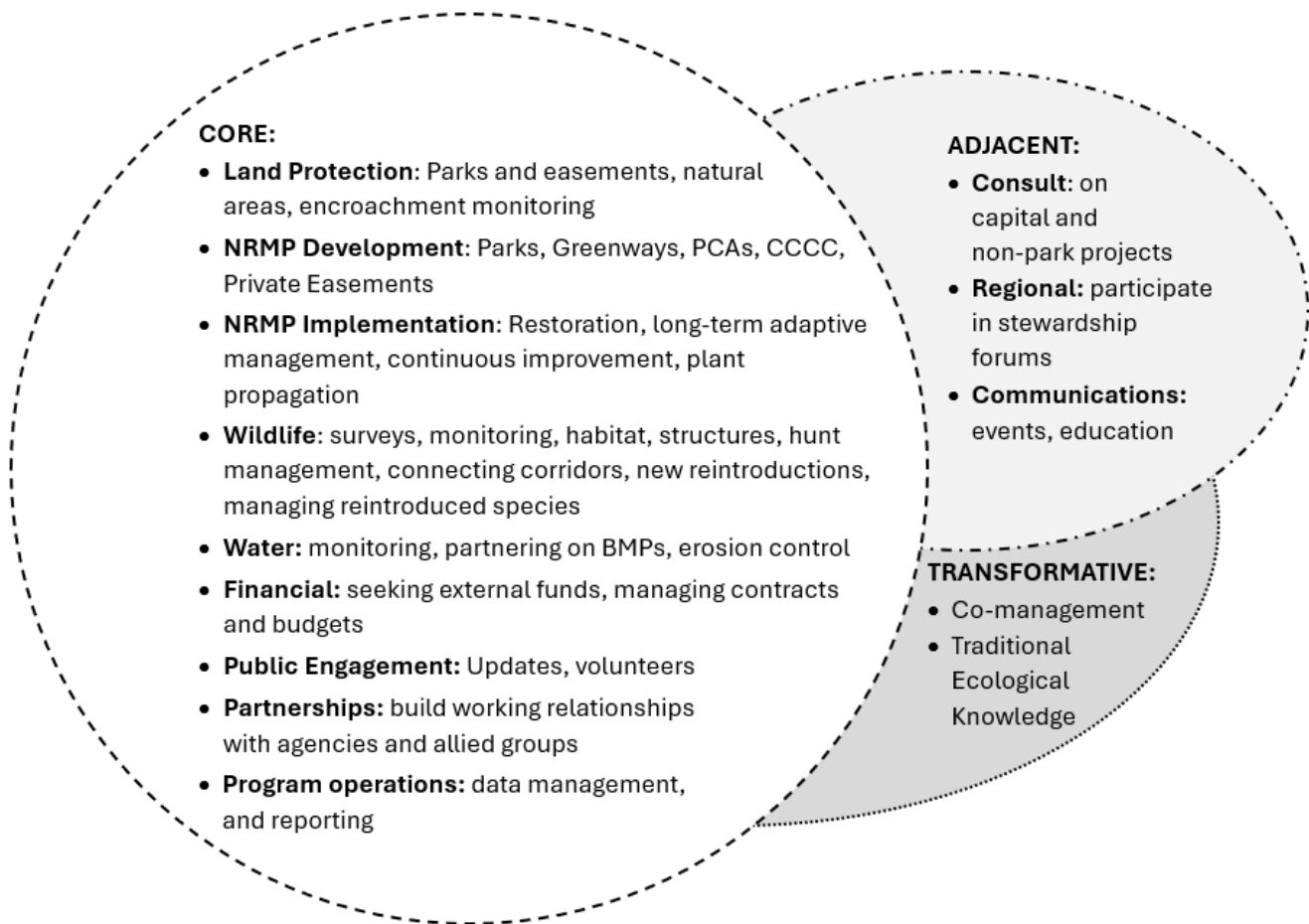


Figure 19: Core, Adjacent, and Transformational Services Diagram

3. Prioritization

Prioritization is part of effective plan implementation and can determine which projects are added to annual and five-year workplans. Priorities for the system can be established in several ways:

- Developing criteria for land protection projects across the system
- Developing criteria for restoration projects across the system
- Prioritizing by the types of units being managed, e.g., park reserves, parks, easements
- Selecting the highest priorities from individual park, greenway, and easement NRMPs
- Prioritizing the individual objectives and actions in this plan
- Prioritizing a list of near-term projects

A combined approach would use some or all these methods.

Prioritization criteria were explored for this plan, for evaluating land protection and restoration projects on ecological merit and recognizing the public benefits of restored landscapes. Restoration and management can be a balancing act that weighs protecting sensitive natural resources with the societal benefits of drawing people into nature. The 2050 Vision Plan speaks to connecting people with nature and reinforcing this reciprocal relationship. Parks play a vital role in providing for public enjoyment and recreation, and they also represent a “last great chance” to protect and restore larger high-quality natural areas that would have otherwise been lost to development.

Dakota County Parks and private lands permanently protected through the Land Conservation Program also play a vital role in providing critical habitat for rare species. Dozens of State-listed rare plant and animal species have been documented on these lands. Parks and private lands provide habitat for animals for breeding and for important stopover/resting/feeding areas during migration. For instance, some shorebirds found at Lake Byllesby Regional Park in May, travel from wintering areas in the southern part of South America to breeding grounds in the Arctic, stopping over at Lake Byllesby to rest and feed. Worldwide, shorebird numbers have declined 33% since 1980. Grassland birds have experienced a 43% decline. Federal, State, County, City and private landowners all have an important role in ensuring that the habitat requirements of these species are protected and available. The art of managing large public natural landscapes lies in delivering both sets of public services in a way that immerses visitors in nature while protecting the most sensitive natural areas.

Proposed criteria in this plan also reflect opportunities to protect and enhance ecosystem services, which are benefits that accrue to everyone from protected and managed lands, whether they are parks, greenways, or private easements. Ecosystem services (ES) are often defined as: *the benefits people receive from nature. They encompass nature’s contributions to the production of food and timber; life-support processes, such as water purification...; and life fulfilling benefits, such as places to recreate or to be inspired by nature’s diversity.*⁵

ES are often categorized according to the Millennium Ecosystem Assessment,⁶ created by an international scientific assessment. The four overlapping categories are:

- *Regulating services* - benefits obtained from the regulation of ecosystem processes
- *Supporting services* - services necessary for production of all other services
- *Provisioning services* - the products obtained from ecosystems
- *Cultural services* - nonmaterial benefits obtained from ecosystems

⁵ Olander, L. P., D. Urban, R. J. Johnston, G. Van Houtven, and J. Kagan. 2016. “Proposal for Increasing Consistency When Incorporating Ecosystem Services into Decision Making.” National Ecosystem Services Partnership Policy Brief 16-01. Durham, NC: Duke University, www.nicholasinstitute.duke.edu/publications.

⁶ Millennium Ecosystem Assessment, 2005. “Ecosystems and Human Well-being: Synthesis”. Island Press, Washington, DC.

The following criteria adapted from the 2020 Land Conservation Plan speak to a combined prioritization approach that can be applied across a spectrum of lands, from heavily developed public spaces to almost pristine natural environments. They also can be applied to private land protection projects, working with willing landowners who are interested in protective easements. These criteria can be used as a general guide or further developed into a scoring system for evaluating future projects.

A. Land Protection Criteria

The following criteria are intended for evaluation of land protection projects, including private landowner easements and natural area protection. A scoring system can be developed to incorporate these elements for ranking multiple project proposals.

Land Protection Within CFAs

- Areas with surface water
- Areas with a combination of uplands and wetlands
- Upland forest and grassland
- Is located within a designated greenway corridor
- Includes culturally sensitive features

Land Protection of Natural Areas outside of CFAs

- Includes ecologically significant or culturally sensitive features
- Provides important wildlife habitat
- Is adjacent to a river, lake, or stream
- Is adjacent to existing protected property with natural habitat
- Is located within a designated greenway corridor
- Provides other environmental benefits and ecosystem services (e.g., surface or [groundwater quality protection, aquifer recharge](#), flood control, connectivity)
- Is considered locally significant open space
- Drinking Water Supply Management Area outside of a CFA
- Woodlot outside of a CFA
- Wetland outside of a CFA
- Other undeveloped land in cities
- Native seed source site

Land Protection within Approved Park System Boundaries

Because acquisition opportunities for park inholdings are relatively infrequent, each situation should be addressed based on landowner interests, significance of the inholding for park purposes, and funding availability.

B. Natural Resource Restoration Criteria

The following elements are suggested as the basis for a scoring system to evaluate potential restoration projects, similar to scoring land protection projects. This is a preliminary list that will be further refined for work planning purposes.

These criteria are focused on the restoration phase – initiating the intensive process to restore ecological health with specific projects. The long-term adaptive management phase is assumed to be essential for any lands that have undergone restoration and should be guided by standards rather than prioritized through criteria.

Water Quality

- Improves water retention and infiltration, especially in headwater areas.
- Installs stream channel and shoreline stabilization projects

- Promotes functional vegetative buffers along water resources where not already required by regulations and/or restores buffers that currently consist of non-desirable species
- Promotes perennial vegetation on critical recharge areas
- Implements erosion control practices and promotes soil health
- Restores natural hydrologic conditions
- Improves aquatic habitat

Ecological

- Existing high-quality natural communities
- Size
- Edge conditions, condition of adjacent lands
- Existing high biodiversity
- Presence of rare or unique species
- Improves pollinator habitat
- Adjacency and connectivity to existing natural areas or restorable areas, promotes connection of habitat links into larger, more functional whole
- High-priority projects identified in individual park, greenway, and easement NRMPs
- Contributes to provision of Ecosystem Services
- Increases opportunities to mitigate climate impacts (sequesters carbon)
- Increases opportunities for climate resilience and adaptation
- Improves habitat for Species of Greatest Conservation Need (SGCN)
- Ends threats from over-utilization
- Eliminates and controls invasive species and promotes desirable species
- Reinstates structural layers, food webs, and spatial diversity
- Ease of restoration

Social

- Includes culturally sensitive resources
- Includes areas of public use or visibility
- Provides potential education opportunities
- Improves aesthetic values
- Promotes landowner involvement on non-County lands
- Promotes City-County Conservation Collaborative on ecologically significant land
- Expands strategic partnerships with other entities
- Promotes information sharing with other entities
- Provides public participation and volunteerism opportunities
- Expands nearby nature experiences for under-represented audiences

Economic

- Restoration cost
- Leveraged non-County funding resources
- Long-term maintenance costs
- Level of landowner commitment (easements)
- Level of partner(s) commitment
- Opportunities for volunteer assistance

Project Alignment

- Distributes projects among Commissioner districts, offering something to residents in every district
- Demonstrates alignment between promoted grants and natural resources work priorities
- Helps expand capacity for partners (assists local governments in natural resources work)

The following example table for restoration projects demonstrates criteria weighting based on the type of management unit and the type of restoration being done. Restoration projects can range from ecologically improving core habitat to native landscaping demonstration projects. For example, ecological criteria would likely have greater weight in prioritizing among ecologically driven projects in a park reserve than prioritizing among landscaping projects at county facilities. The social criteria may be more highly weighted at high-use park areas or other county facilities, where visibility and educational value may be more important.

Potential Restoration Project Criteria Weightings (1-5 scale): Example Only

Project/Unit Type	Ecological	Water Quality	Social	Economic	Alignment
Park Reserve Restoration	5	5	4	3	2
Regional and County Park Restoration	4	4	5	3	3
County Park Conservation Area Restoration	5	5	3	3	2
Greenway Restoration	3	3	4	4	5
Easement Restoration (willing landowner)	3	4	4	4	4
County Facility Native Landscape Planting	2	3	5	3	4

Figure 20: Potential Weighting for Prioritization Criteria

C. Prioritization Based on Unit Type

This approach prioritizes the types of units being managed based on their general ecological potential. Key factors such as core habitat opportunities, intact native communities, size, edge conditions, and diversity vary across the different types of units, with Park Reserves generally offering the greatest opportunities to protect and enhance ecological functions.

General Restoration Priority

1. Park Reserve
2. Regional Park or County Park
3. Easement or Park Conservation Area
4. Greenways and Other Public Lands (e.g., city park on a greenway)
5. County Facility Native Landscape Planting

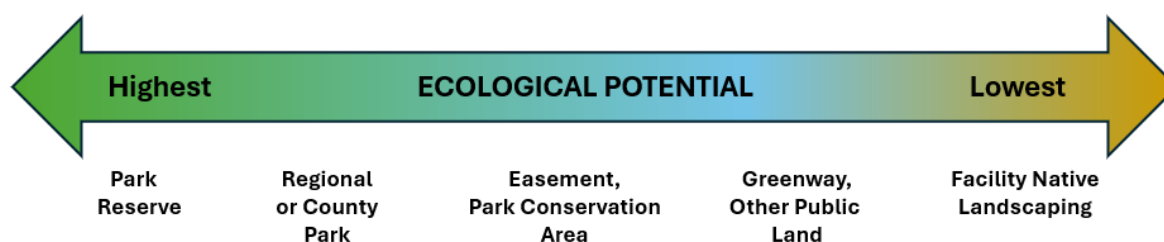


Figure 21: Generalized Ecological Potential Across Protected Land Types

D. Integrating Priorities from Individual NRMPs into System Priorities

Individual Natural Resources Management Plans (NRMPs) are prepared for each unit – parks, greenways, and private easements (working with willing landowners). Each NRMP includes implementation priorities that generally are tied to individual project areas within each unit. The preceding system-level prioritization criteria incorporate priority ratings from individual unit NRMPs.

The general flow for implementing an NRMP is:

1. **Year zero:** Complete an individual unit NRMP that identifies and prioritizes projects and includes work units, tasks and budget estimates. Work units are sized so that a unit or multiple units can be rolled into a project and submitted for a grant (generally under \$500k). NRMPs have as many high-priority units as needed, although 1 to 3 high priorities will be applied for within 5 years.
2. **Year one:** Seek grant funding for and begin high-priority project(s) as identified in the NRMP.
3. **Years two and three:** continue restoration, monitor progress and early results, and incorporate lessons learned into future planning.
4. **Year four or five:** Seek grant funding for and begin another high-priority NRMP project.
5. **Year five-plus:** Update the NRMP to incorporate lessons learned, changes in conditions of old units, priorities based on monitoring, and any new best practices. The update begins only if another project is likely to begin within a year or so, contingent on staffing capacity to take on new projects.

4. Desired Outcomes within Five Years

This section summarizes proposed outcomes over the next five years, drawing from existing workplans, new initiatives from the 2050 Vision Plan, and new initiatives from objectives and strategies in this plan.

Areas addressed include:

- Active Restoration Acres (parks, greenways, easements)
- Active Maintenance Acres (parks, greenways, and easements)
- Wildlife Projects
- Water Quality Projects
- Native Plant Propagation
- Outreach/Education/Volunteerism
- Administration

A. Five-Year Work Plan for Acquisition and Restoration

The following table summarizes high-priority acquisition and restoration projects for parks, greenways, and easements planned for implementation over the next five years. It also includes projections for the anticipated number of new private easements, based on historic program participation. This five-year plan consumes most current staff resources and partially relies on external funding. The need for flexibility is implicit in implementing this plan. If external or internal funding for given projects is not secured, those projects will be paused or deferred until funding is available.

Across all project types over the next five years, 3,297 acres are projected for easement acquisition, NRMP planning, and restoration. These projects have requested and/or secured outside funding.

Categories	5 Year Total Cost Estimate	External Funding (Secured and Being Sought)	Secured County Match / Unsecured Match Needed	Acres	Projects
CCCC, Non-Greenway Restoration	\$1,665,375	\$1,665,375	\$0 / \$0	314	8
Easement Acquisition	\$1,277,500	\$1,277,500	\$0 / \$0	176	Up to 10
Easement Restoration	\$2,317,609	\$2,317,609	\$0 / \$0	944.8	22
Greenway Restoration (including CCCC)	\$2,547,700	\$2,710,150	\$100,200 / \$101,350	366.8	44
Park and CPCA Restoration	\$13,807,925	\$13,433,925	\$88,000 / \$286,000	1,480.6	35
Water Quality Projects and Monitoring	\$1,035,000	\$750,000	\$35,000 / \$250,000	15	6
Total	\$23,015,109	\$22,154,559	\$223,200 / \$637,350	3,297.2	116

Figure 22: Five-Year Planned Acres for Acquisition and Restoration (not including long-term maintenance)

Additional projects are planned for the near-term, likely for 2028 and beyond, for which outside funding has not been requested or secured.

Categories	5 Year Cost Estimate	Acres	Projects	Estimated Match Needed
CCCC, Non-Greenway Restoration	\$400,000	40	1	
Easement Restoration	\$2,000,000	170	1	
Greenway Restoration (including CCCC)	\$1,380,000	185.5	6	Unknown
Park and CPCA Restoration	\$4,760,000	626.74	13	\$357,000
Total	\$8,540,000	1022.24	21	\$357,000

Figure 23: Additional Unfunded Projects for the Next Five Years

Long-term management of these living systems is essential. The following chart shows growth in long-term management needs over the course of plan implementation, as newly restored acres transition to management. System growth will also increase the total acres requiring management over time, potentially within the five-year horizon. Refer to section 8 for additional information on system growth.

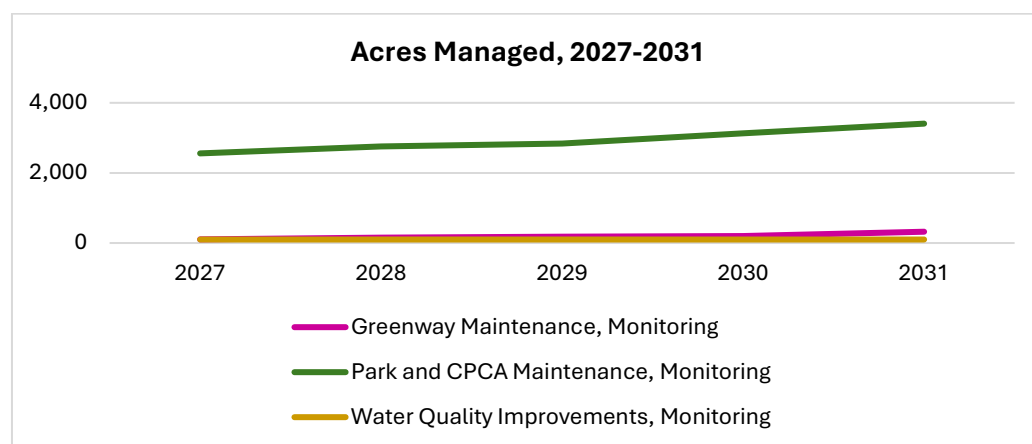


Figure 24: Growth of Long-Term Management Acres over Five Years

Additional planned work and projects that do not involve acres as a key metric include:

- Administration and public communications
- Capital and transportation project planning, advisory role
- Volunteer engagement
- Wildlife and vegetation monitoring
- Wildlife projects
- Greenhouse operations and native plant propagation
- Budget and grant management



Prairie Plants Hardening Outside the Greenhouse

B. Project Highlights for the Next Five Years

Specific restoration initiatives within the above five-year summary include some of the following park projects. Long-term management of previously restored areas is also included.

LAKE BYLLESBY REGIONAL PARK

Restoration: 198 acres

- Restoration and enhancement (145 acres)
- West Unit: west of MN 56 (53 acres)
- Additional restoration RBD

Long-Term Management: 130+ acres

LEBANON HILLS REGIONAL PARK

Restoration: 217 acres

- West section restoration with sustainable trails work: 210 acres
- Former shop restoration, 7 acres
- Additional restoration TBD

Long-Term Management: 1,900+ acres

Future Years:

- Middle Park restoration with sustainable trails

MIESVILLE RAVINE PARK RESERVE

Restoration: 117 acres

- Phase IV Restoration, 81 acres
- Trout Brook Restoration, Phase III, 36 acres

Long-Term Management: 600+ acres

Future Years:

- Restoration of additional management units identified in the NRMP

THOMPSON COUNTY PARK

Restoration: 16.7 acres

- Savanna re-establishment, 8.5 acres
- Food Forest, 5 acres
- Pollinator Promenade, 3.2 acres

Long-Term Management: acres TBD



Lake Byllesby, Sandstone Bluffs



Lebanon Hills Star Pond Savanna

SPRING LAKE PARK RESERVE

Restoration: 342 acres

- NRMP units and 1, 16 and 19, 114 acres
- Church's Woods, 120 acres
- Upper Spring Lake restoration, 93 acres
- Ravine Stabilization Project, 15 acres
- Native Landscaping around Capital Projects (Fischer Avenue Trailhead, Mississippi River Access at Bud's Landing)

Long-Term Management: 380+ acres

Bison Range Management

Tree Disease Control

Future Years:

- Restoration of additional NRMP Units

WHITETAIL WOODS REGIONAL PARK

Restoration: TBD

Long-Term Management: 430 acres

GREENWAYS

Restoration and Management Projects:

Minnesota River, Lake Marion, Mississippi River, North Creek, River to River, Veterans Memorial, 174+ acres

EASEMENTS

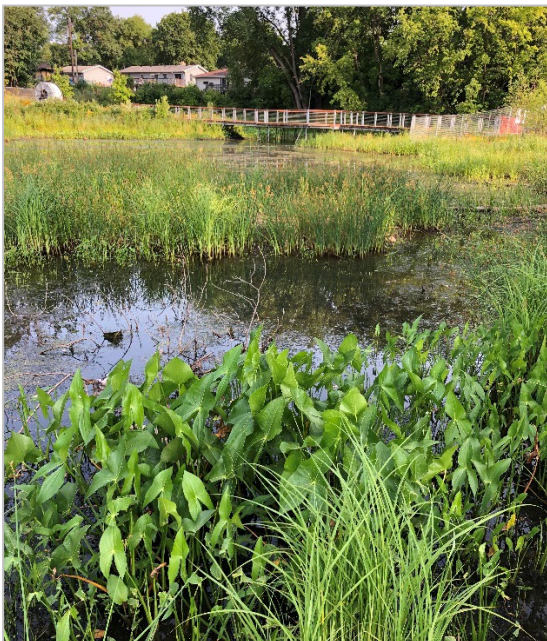
Restoration on multiple properties, 600+ acres.



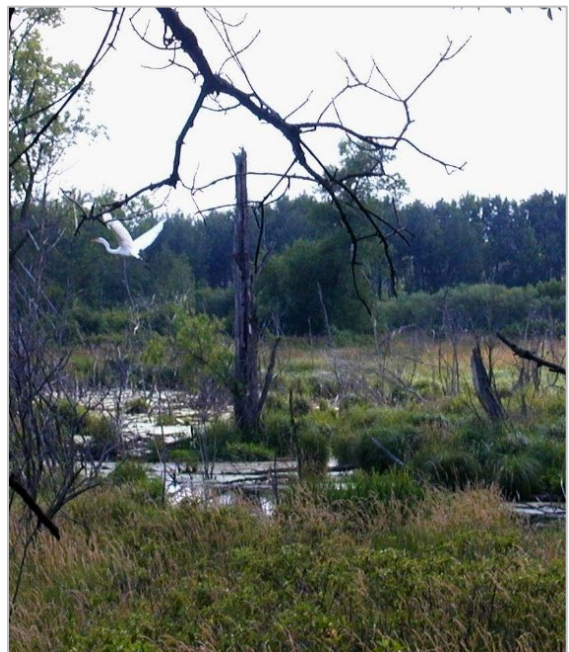
Miesville Ravine, Trout Brook Restoration



Spring Lake Bison Herd



Thompson County Park, Wetland Planting



Whitetail Woods Wetlands

C. 2050 Vision Plan Initiatives

The following tables include new initiatives identified by objectives and strategies in the 2050 Vision Plan with anticipated timelines

2050 Vision Plan Initiatives for Ten Years	Status	Start
Develop NRMPs for County Park Conservation Areas and a naming strategy.	new	2026-2031
Employ Indigenous experts using Traditional Ecological Knowledge (TEK).	New-ongoing	2026-2031
Seek legislative authority to own land for conservation purposes.	new	2026-2031

Figure 25: Vision Plan Initiatives for the Next Five Years

D. New initiatives from the Natural Systems Plan

The following new objectives and strategies emerged from the update of this plan. Most are anticipated to start within the five-year horizon.

Priority New NSP Initiatives Related to Natural Systems	Status	Start
NS1a. To protect the ecological and financial investment in the acres restored, secure stable funding for long-term adaptive management.	New	2026-2031
NS1a. Explore options for using a private funding entity to secure and disburse private funds for natural resource restoration and maintenance on protected private lands.	New	2028-2031
NS1b. Designate selected areas within the park system that have higher natural resource quality, unique habitat value, restored areas, or areas with sensitive cultural resources as places where the priority use and management will be to protect, improve, and maintain resource integrity. Limit recreational use and access in areas with the most sensitive resources on a temporary or permanent basis.	New	2026-2031
NS2. Manage natural systems to mitigate and improve resilience to the impacts of a changing climate. NS2a. Strengthen ecosystem diversity and health to withstand climate impacts. NS2b. Use adaptive science-based practices to prepare for future conditions. NS2c. Increase carbon sequestration within the system and other areas. NS2d. Reduce the carbon footprint of management activities.	New	2026-2031
NS5. Manage habitat to sustain native and rare species, increase biodiversity, and enhance ecosystem health on permanently protected lands. NS5a. Monitor and manage wildlife populations to sustain ecological balance and support adaptive management. NS5b. Enhance habitat connectivity and wildlife movement across the landscape.	New and ongoing	2026-2031
OP3. Inform and engage the public on natural systems management.	New	TBD
OP4. Refine system-wide prioritization for annual and five-year workplans with criteria-based scoring.	New	TBD
OP5. Develop and refine metrics to document system-wide and project-level progress.	New	TBD
OP6. Develop a staffing structure to more effectively address system growth and needs.	New	TBD
OP6d. Develop staffing ratios to identify FTE needs as the system grows.	New	TBD
OP6e. Identify appropriate position banding for project specialists that manage projects.	New	TBD
OP6f. Implement the findings of the Office of Performance Analysis study related to temporary staffing.	New	TBD

Figure 26: NSP New Initiatives

5. Metrics and Reporting

This plan recommends refining several sets of metrics to track plan implementation progress, facilitate operations, and prepare reportable information for officials and the public. Metrics should include both quantitative and qualitative measures.

The Natural Resources Unit collects large quantities of data, which generally require further analysis and synthesis to develop clear findings for system and/or unit level reporting. It can be challenging to design smooth pathways from large volumes of field and project management data into reportable information that tells a clear story to the public, officials, and funders.

A. Tracking Based on Audience Needs

Data collection and synthesis into findings can meet several distinct needs for different audiences:

1. Reporting to elected officials and commissions

- a. Provide overall status of the unit's work (e.g., restoration, volunteers, etc.)
- b. Provide project-specific updates
- c. Support related annual budget and CIP requests, identify gaps

2. Reporting to the public

- a. Provide overall status of the unit's work (e.g., restoration, volunteers, etc.)
- b. Provide updates on specific projects
- c. Generate interest in and support for the work
- d. Encourage volunteer participation

3. Reporting to grant funders

- a. Provide overall status of the project and manage grant reporting requirements
- b. Provide accountability on how grant funds are being spent

4. Providing a feedback loop to adaptive management

- a. Collecting and interpreting monitoring and field data on restoration performance for specific projects
- b. Identifying common factors across projects that influence outcomes (soils, terrain, weather) and long-range data for identifying trends

5. Guiding the Natural Resources Unit's work with operational data

- a. Developing cost data for different types of restoration and management projects over time with multipliers for challenging conditions
- b. Identifying staff time required for different types of projects and/or acres of land being restored or managed
- c. Understanding volunteer program participation and efficacy
- d. Tracking the status of many private landowner projects
- e. Tracking implementation of the five-year workplan, this plan, and individual NRMPs (annually)
- f. Others, as needed

Timing of measurements:

Measurements should be taken at agreed-upon intervals for internal tracking and/or reporting.

Recommended metrics are based upon a) ongoing projects in the workplan and the system as a whole (monthly to quarterly) and b) progress against plan with the NSP objectives and strategies (annually).

B. Current Program and Service Inventory Metrics (PSI)

PSI metrics are a brief set of measurements reported annually to the Board and the public. They are designed to answer three questions related to programs and services provided by County departments and work units:

1. How much did we do?
2. How well did we do it?
3. Is anyone better off?

The Parks Natural Resources Unit currently reports on the following three PSI measures each year:

Restoration and Maintenance

How Much: Acres of completed restoration now being maintained

How Well: Percent of vegetation restoration in parks funded with external dollars

Better Off: Out of 100, resident rating of protecting and improving natural resources

Propagation

How Much: Number of plants installed in the past year

How Well: Number of species installed in the past year

Better Off: Dollar value of the plants produced

Volunteerism

How Much: Number of active volunteers

How Well: Retention: Number of people volunteering more than once in a year, or over multiple years

Better Off: Dollar value of donated hours, saving County taxpayers

Additional metrics related to core services could include:

- Wildlife health, especially for reintroduced species
- Water quality
- Partnerships
- Completion of projects based on priority ratings

C. Tracking Tools

Tracking tools should be effective, consistent, and relatively easy to use in collecting and compiling data, particularly for recurring metrics that provide a long-range picture of trends over time. The Natural Resources Unit uses a variety of data collection, analysis, and synthesis tools, from field notes and photographs to Geographic Information Systems (GIS).

This plan suggests a review and evaluation of existing tracking methods with an eye to making the types of improvements that align with operational and reporting needs.

6. Budget and Capital Improvement Program

Staff in the Natural Resources Unit annually prepare budget and Capital Improvement Program (CIP) requests for review and approval by County Administration and the County Board. Both fiscal planning tools cover a five-year horizon.

Natural Resources have benefitted from significantly increased investment in both operating budgets and the CIP Base Funding since the Board adopted the adopted the Natural Resource Management System Plan (NRMSP) in 2017. Over the course of a decade, internal and secured grant funding increased from \$2M in 2016 to \$5M in 2026.

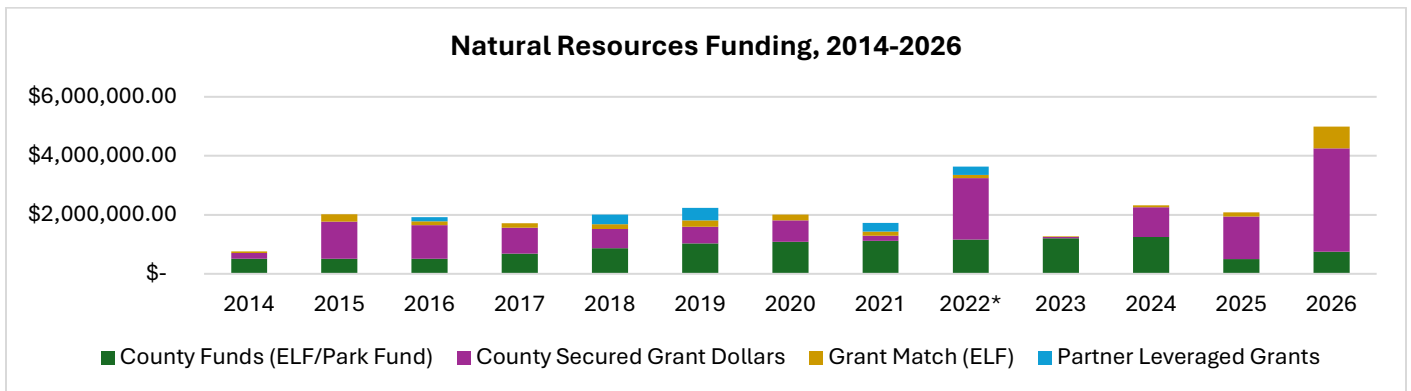


Figure 27: Funding for Parks Natural Resources Management, 2014-2025

Internal revenues have been derived primarily from the Dakota County Environmental Legacy Fund (ELF), comprised of revenues from landfill host fees and the County's gravel tax. Direct natural resource expenses are included in the Parks CIP, although this total doesn't include smaller restoration areas and native landscaping projects implemented as part of a larger development project. Natural resources work is also being done outside of the NR Unit's CIP, although their staff are involved. Examples include wildlife tunnels under Cliff Road during its reconstruction and ravine stabilization projects using external funding with match funding from other County departments.

The five-year implementation costs for this plan include costs directly related to management of natural systems as well as other costs related to program administration, volunteer coordination, education, and consultation on capital and planning projects. The following table includes estimated costs for **protection and restoration** of almost 3,300 acres in the system, with an overall total cost of \$23M. The County typically provides a 10 to 25 percent match for outside funding, reflected in the "County Share" column using 25 percent, with a committed County cost of \$223,200. An additional \$637,350 in match is needed for these projects, for a total of \$860,550 in County funds.

Categories	5 Year Total Cost Estimate	External Funding (Secured and Being Sought)	Secured County Match / Unsecured Match Needed	Acres	Projects
CCCC, Non-Greenway Restoration	\$1,665,375	\$1,665,375	\$0 / \$0	314	8
Easement Acquisition	\$1,277,500	\$1,277,500	\$0 / \$0	176	Up to 10
Easement Restoration	\$2,317,609	\$2,317,609	\$0 / \$0	944.8	22
Greenway Restoration (including CCCC)	\$2,547,700	\$2,710,150	\$100,200 / \$101,350	366.8	44
Park and CPCA Restoration	\$13,807,925	\$13,433,925	\$88,000 / \$286,000	1,480.6	35
Water Quality Projects and Monitoring	\$1,035,000	\$750,000	\$35,000 / \$250,000	15	6
Total	\$23,015,109	\$22,154,559	\$223,200 / \$637,350	3,297.2	116

Figure 28: Estimated Acquisition and Restoration Costs, 2027-2031

The next table and chart show the estimated total costs for long-term adaptive management ("maintenance") of parks and greenways. Outside funding has not been used for maintenance and opportunities may be limited. Note that easements are not included, as maintenance of restored easements typically has been a landowner responsibility.

Year	Greenway Maintenance	Park and CPCA Maintenance	Total
2027	\$220,000	\$1,245,262	\$1,465,262
2028	\$263,200	\$1,398,354	\$1,661,555
2029	\$311,621	\$1,714,343	\$2,025,964
2030	\$380,970	\$1,850,043	\$2,231,012
2031	\$476,319	\$1,928,876	\$2,405,195
Total	\$1,652,110	\$8,136,878	\$9,788,988

Figure 29: Long-Term Adaptive Management Costs to 2031, Parks and Greenways

The combined County costs for acquisition, restoration, and maintenance for the five-year period are \$10.7 M, or \$2.13 M per year.

As the Parks Natural Resources Unit begins implementation of the Natural Systems Plan in 2026, challenges to continuing the recent pace of restoration and management work have emerged:

1. Due to financial changes and constrained budgets, the gap is growing between projected long-term maintenance costs and projected funding. ELF funds have been projected to be reduced for the next five years from \$1.2 M to \$750,000 per year.

2. Additional new restoration work will have to be based on external funding. Reduced availability of local match funds may have impacts to grant success.
3. Water and wildlife projects will also become more dependent on external funding. Reduced availability of local match funds may have impacts to grant success.
4. Long-term management of restored private lands has not been addressed with sustainable funding.

Continuing with long-term management of previously restored acreages is a high priority, necessary to maintain ecological quality without backsliding toward a pre-restoration state. Based on park and greenway restoration projects that are already underway, the number of park system acres requiring long-term maintenance will increase over the next five years by 300 to 1,400 acres. Maintenance funding currently is not keeping pace with the needs, and the gap will grow in coming years.

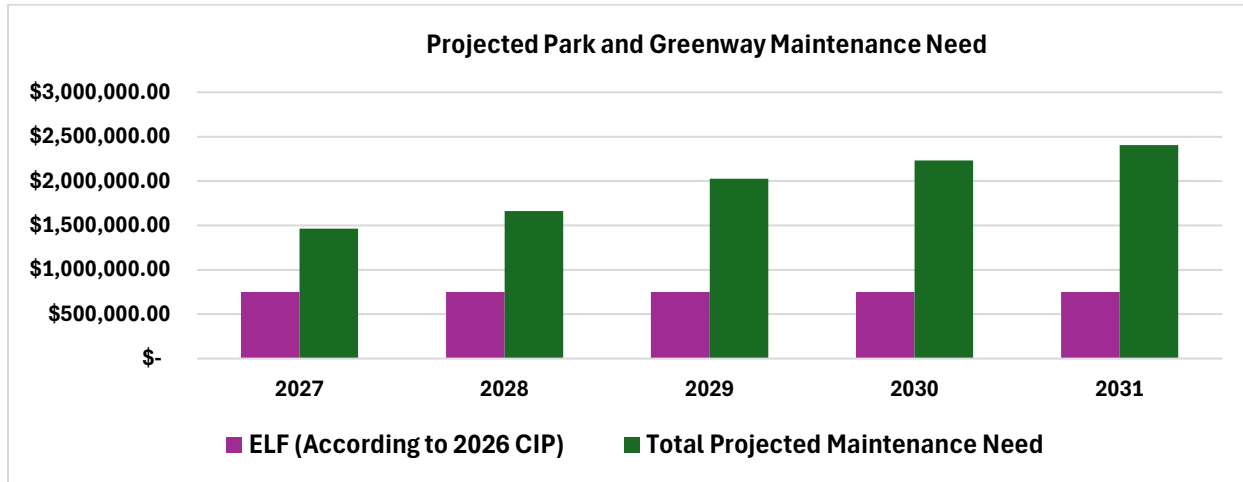


Figure 30: Projected Maintenance Needs

Options to manage limited funds available for long-term maintenance include:

- Identifying a more sustainable funding source for the critically important work of long-term maintenance. In 2026, the County initiated a study of potential funding sources for Parks as a whole. Additional study is needed to identify a sustainable long-term funding source for County natural area easements on private lands.
- Limiting new restoration work to the highest priorities (see Section 3 of Chapter 3).
- Adjusting maintenance standards and schedules to reflect funding constraints while minimizing ecological quality losses.
- Acknowledging a need for flexibility in implementing the five-year work plan. This could be based on identifying number of acres that can be managed under different funding scenarios (low, medium, and high).
- Seeking more opportunities to apply external funding to long-term maintenance. Gain greater insight on what types of projects are likely to receive funding.
- Developing more refined costs estimates for water and wildlife projects. Wildlife and water projects should also be prioritized and will likely need external funding.
- Leveraging the work of partner organizations in securing funding for park and greenway restoration and maintenance work.
- Working with organizations and groups that can assist landowners in managing natural area easements by supporting each other.
- Advocating for additional state and regional investment.

7. Potential Funding Sources

Successful land protection and management require sufficient funding, typically sustained through collaboration and robust grant opportunities. An inventory of available funding programs follows.

A. Federal Funding

U.S. Department of Agriculture-Natural Resource Conservation Service:

Conservation Easements

- The [Agricultural Conservation Easement Program \(ACEP\)](#) includes the Agricultural Land Easements (ALE) Program and the Wetlands Reserve Easements (WRE) Program. WRE also includes the Wetland Reserve Enhancement Program (WREP), which works with willing landowners to protect and restore wetlands. ACEP provides matching funds that can be used to purchase permanent conservation easements on agricultural land, grasslands, and wetlands and to assist with grassland and wetland restoration.
- The [Healthy Forest Reserve Program](#) helps protect and restore forest lands. Conservation projects must benefit endangered species, improve biodiversity, or enhance carbon sequestration. This program funds restoration activities as well as permanent or 30-year easements.
- The [Community Forests Program](#) provide financial assistance to local governments, tribal governments, and qualified nonprofit entities to establish community forests that provide continuing and accessible community benefits.

Regional Conservation Partnership Program (RCPP)

- The **RCPP** enlists local governments, state agencies, tribes, and others to coordinate conservation on a national or state scale and engages landowners and agricultural producers in conservation activities to improve water, soil, wildlife habitat, or other natural resources. Conservation easements may be acquired using RCPP funds and cost-share funding is available.

Conservation Practices

- The [Environmental Quality Incentives Program](#) provides financial and technical assistance for activities on agricultural lands that benefit air quality, water quality, soil and water conservation, and wildlife habitat.
- The [Conservation Stewardship Program](#) helps maintain, improve, and expand activities on working lands that benefit natural resources (including soil, water, air, and wildlife habitat) or conserve energy.
- The **Conservation Reserve Program (CRP)** is the largest voluntary land conservation program in the United States, signed into law in 1985 and administered by the USDA Farm Service Agency. In exchange for a yearly rental payment, farmers enrolled in the program remove environmentally sensitive land from production and establish vegetative cover that will improve environmental health and quality. CRP contracts are 10-15 years in length. The long-term goal is to re-establish land cover that helps improve water quality, prevents soil erosion, and reduces loss of wildlife habitat. CRP participation in Dakota County peaked in the 1990's, with nearly 9,000 acres enrolled. From 1995 through 2024, CRP paid \$11.8 M in rent to Dakota County landowners.
- The **Conservation Reserve Enhancement Program (CREP)**, a part of CRP, is a partnership between state and federal government. CREP targets specific conservation concerns and uses federal funds to supplement non-federal funds. Landowners who remove environmentally sensitive land from agricultural production and establish permanent resource-conserving plantings

are paid annual rent and other incentives. Participation is voluntary, and contracts typically run 10-15 years. Minnesota requires that CREP property to go into a perpetual easement through Reinvest in Minnesota at the end of the CREP contract.

U.S. Fish and Wildlife Service

- The [North American Wetlands Conservation Act \(NAWCA\)](#) provides competitive matching grants to increase bird populations and wetland habitat, while supporting local economies, hunting, fishing, bird watching, family farming, and ranching.
- The **Partners for Fish and Wildlife Program** provides technical and financial assistance to private landowners to plan, design, supervise, and monitor customized habitat restoration projects. Priority goes to projects judged likely to provide habitat for rare, threatened and endangered species. Projects have a minimum duration of 10 years. Participating landowners do not forfeit any property rights and are not required to allow public access.
- The **Habitat Easement Program** provides funds for permanent easement on existing or restorable wetlands and grasslands, preferably close to other protected lands. Haying and/or grazing may be allowed.
- The **Wetland Easement Program** provides payment for permanent easements on existing or restorable wetlands. Protected wetlands cannot be drained, filled, leveled, or burned. Haying, grazing and/or farming wetlands may be allowed if wetlands dry up naturally.
- The [Forest Legacy Program](#) protects private forest land by purchasing conservation easements or land in fee from voluntary landowners.

B. State Funding

Environment and Natural Resources Trust Fund

In November 1988, Minnesota voters passed a constitutional amendment permanently establishing the Environment and Natural Resources Trust Fund (ENRTF). This constitutionally dedicated fund originates from a combination of Minnesota State Lottery proceeds and investment income. The ENRTF supports projects with the public purpose of protection, conservation, preservation, and enhancement of the state's air, water land, fish, wildlife, and other natural resources. The Legislative-Citizen Commission on Minnesota Resources (LCCMR) governs this fund and makes annual funding recommendations to the legislature.

The County has received past ENRTF funding for development of the Farmland and Natural Area Protection Plan, development of the Farmland and Natural Areas Program Guidelines, Vermillion River Corridor Plan, funding to acquire conservation easements, and funding through the Metropolitan Council to acquire greenway and regional parkland.

Clean Water, Land and Legacy Fund

In November 2008, Minnesota voters approved the Clean Water, Land and Legacy Amendment, which dedicated a sales tax increase of 3/8 percent (0.375) to clean water, natural areas, parks, arts education and history through 2034. Three primary funds can be used for conservation purposes:

- **The Outdoor Heritage Fund (OH)** restores, protects and enhances wetlands, prairies, forest and habitat for fish, game, and wildlife. The Lessard-Sams Outdoor Heritage Council (LSOHC) oversees this fund and makes annual recommendations to the legislature. The County has received a total of \$20.7 million in OH funds since 2008. The Minnesota Legislature passed the Omnibus Outdoor Heritage Fund, Legacy, and Lands bill on May 17, 2026, renewing funding for 53 programs and distributing \$191.5 million for habitat, restoration, and watershed protection in Minnesota.

- **The Conservation Partners Legacy** (CPL) Grant Program funds projects that restore, enhance, or protect forests, wetlands, prairies, and habitat for fish, game, and wildlife in Minnesota. Funding for the CPL program is from the Outdoor Heritage Fund. The CPL Program has been reviewed by the LSOHC and approved by the MN Legislature annually since 2009. The MN DNR manages this reimbursable program to provide competitive matching grants from \$5,000 to \$500,000 to local, regional, state, and national nonprofit organizations, including government entities.
- **Clean Water Fund** grants are used to protect, enhance, and restore water quality in surface and groundwater. The Clean Water Council, as well as an interagency committee of state agencies, makes funding recommendations to the governor.
- **Parks and Trails Fund** grants support parks and trails of regional or statewide significance. Funds are divided among the ten Metropolitan Regional Park Implementing Agencies (including Dakota County), the Minnesota Department of Natural Resources for state parks and trails, and Greater Minnesota Regional Parks and Trails Commission for grants to counties and cities outside the metropolitan area.

Minnesota Department of Natural Resources (DNR)

- A range of **Local Park and Natural Area Grant Programs**, such as the Conservation Partners Legacy Grant Program, Federal Recreational Trail Program, Local Trail Connections Program, National Outdoor Recreation Legacy Partnership Program, Natural and Scenic Area Program, No Child Left Inside Grant Program, and Outdoor Recreation Grant Program provide matching funds to local governments and organizations for a variety of conservation and recreation projects.

Board of Water and Soil Resources (BWSR)

- **Managing Invasives for a Resilient Landscape Grants** provides funding to support the restoration of native plant communities in areas impacted by terrestrial invasive or noxious weeds. Administered by the Minnesota Board of Water and Soil Resources (BWSR), the program provides funding to support collaborative efforts that manage terrestrial invasive plant species and reestablish resilient native vegetation. Tribal Governments, Local Government Units, Municipalities, and Townships are eligible for funding.
- **Clean Water Fund Grants.** Two types of grants are available:
 - **Projects and Practices Grants** invest in on-the-ground projects and practices that will protect or restore water quality in lakes, rivers or streams, or will protect groundwater or drinking water.
 - **Drinking Water Projects and Practices Grants** emphasize land treatment projects and practices that will protect or improve drinking water sources.

Reinvest in Minnesota

The Reinvest in Minnesota (RIM) conservation easement program permanently protects habitat and water resources. It is primarily funded through legislative bonding, and the Clean Water and Outdoor Heritage Fund. It is administered by the Board of Water and Soil Resources. The Re-Invest in Minnesota Critical Habitat Match program is administered by the DNR for the protection of wildlife habitat. It is funded by legislative bonding, license plate sales and private donations.

C. Regional Funding

The Metropolitan Council (MC), the planning agency serving the Twin Cities seven-county metropolitan area, works with ten Regional Park Implementing Agencies (IAs) to award grants to finance land acquisition and development of the parks system.

- The **Acquisition Opportunity Fund (AOF)** provides up to 75 percent of acquisition funds for IAs acquiring land for the Regional Parks System. The AOF comprises state and regional funding sources in two separate accounts:
 - The Parks and Trails Legacy Fund / Park Acquisition Opportunity Fund account funded by state Legacy dollars and regional park bonds.
 - The ENRTF / Park Acquisition Opportunity Fund account funded by ENRTF dollars and MC funds.
- **Operation and Maintenance (O and M)** funding includes dollars from the State General Fund and “Lottery in lieu of sales tax,” distributed by MC according to a formula to IAs for operating and maintaining the Regional Parks System. O and M can include natural resource restoration and maintenance, which is up to individual Agency discretion.
- The **Regional Parks Bonding Program** is intended for acquisition, development, and redevelopment projects. The State of Minnesota can issue bonds appropriated for the Regional Parks System matched with MC-issued regional park bonds. The funds are disbursed to IAs according to the population within the jurisdiction of each IA and the number of visits an IA hosted from people who live outside the Agency’s jurisdiction.
- Approximately 62,000 acres of agricultural land in the County is currently enrolled in the **Metropolitan Agricultural Preserves Program**, which is administered by individual townships. The Program stipulates that development cannot occur for eight years after “un-enrolling” and it provides a \$1.50 per acre property tax reduction. The Legislative Auditor concluded that the program has been effective in preserving agricultural land, but it should not be considered as permanent protection.

D. County Funding

The **Environmental Legacy Fund (ELF)** was established in December 2015 for the purpose of protecting and enhancing the environment in the County. The ELF receives revenue from two primary sources:

- **Host Fees** are negotiated with six landfills located in the County (two municipal solid waste, one industrial waste, and three construction/demolition landfills). Host fee agreements were updated in 2023, with an increase in most of the fees that have an annual escalator. Revenues are also based on volume and can fluctuate considerably. Host fees generated about \$11.2 million in 2025.
- **Gravel Tax Revenues** generate fifteen percent of the annual funding deposited in ELF. The gravel tax is also based on volume and has fluctuated based on markets. The gravel tax generated \$1,148,828 for Dakota County in 2024, the highest amount in the State.¹

Most of the ELF funding is used for County programs, including matching dollars for grants or funding to partners for projects that directly relate to County goals and objectives. Specific County activities that are eligible for ELF support include brownfield redevelopment, environmental capital projects, Environmental Resources Department operations, gravel pit remediation, natural area and shoreland conservation, park/greenway management plan improvements, and implementation of the County’s Natural Systems Plan and Solid Waste Master Plan.

Dakota County is evaluating potential new sustainable funding streams as of 2026. The following table summarizes various grant opportunities for activities in this plan.

Potential Funding Sources	Acquisition	Restoration	Long-Term Management
U.S. Department of Agriculture, Natural Resources Conservation Service			
Agricultural Conservation Easement Program	X	X (Wetland)	
Community Forests Program	X		
Conservation Reserve Program (CRP)		X	X
Conservation Reserve Enhancement Program (CREP)		X	X
Conservation Stewardship Program			X
Environmental Quality Incentives Program			X
Forest Legacy Program	X		
Healthy Forest Reserve Program	X		
Regional Conservation Partnership Program			X
U.S. Fish and Wildlife Service			
Habitat Easement Program	X		
North American Wetlands Conservation Act	X	X	
Partners for Wildlife Grasslands Restoration Program		X	X
Partners for Wildlife Wetlands Restoration Program		X	X
Wetland Easement Program	X		
State of Minnesota			
Clean Water Fund	X	X	X
Conservation Partners Legacy Program	X	X	X
Environmental and Natural Resources Trust Fund	X	X	
Outdoor Heritage Fund	X	X	
Parks and Trails Legacy Fund	X	X	
Reinvest in Minnesota	X		
Minnesota Department of Natural Resources			
Natural Resource Fund (20 specific-use accounts)		X	
Metropolitan Council			
Regional Parks Acquisition Opportunity Fund	X		
Regional Parks Operation and Maintenance Fund		X	X
Regional Parks Bonding	X		
Metropolitan Agricultural Preserves Program	X		
Dakota County			
Environmental Legacy Fund	X	X	X

Figure 31: Funding Opportunities and Eligible Expenses

8. Program Operations and Partnerships

A. Staffing Model

Staffing models for natural resources often rely on strategies that meet fluctuating environmental and budgetary demands. The Parks Natural Resources Unit currently relies on a hybrid staffing approach, blending fixed staffing with seasonal labor and contracted services. The Unit currently includes a manager, two supervisors, an Indigenous Tribal Liaison, a Land Conservation Project Manager, seven specialists who manage restoration and maintenance work, four technicians, and a variable number of seasonal technicians. Under the current model, most staff work in multiple disciplines including vegetation, water, and wildlife projects. Two staff specialize in Land Conservation and management of the bison herd.

Water resources are not a specialized area within the Natural Resources Unit because much of the work in water management is accomplished through partnerships with other County departments, the Dakota County Soil and Water Conservation District (SWCD), watershed management organizations, and non-profit organizations. An identified skills gap in aquatic ecology expertise exists.

Currently, most staff also cover a broad range of functional needs, including administrative management (e.g., project management, contracts, reporting, partnerships, and grants) and technical functions (e.g., project planning, monitoring, data management, prescribed burns, and spraying).

Seasonal staff play a critical role in furthering the goals of the Natural Resources Unit. They are the primary staff responsible for implementing wildlife and vegetation monitoring, native landscape area maintenance, and native plant propagation. They also play a significant role in volunteer engagement and bison herd management. If funding for seasonal staff is reduced, critical tasks, such as weekly bison wellness and fence checks, would still need to be completed, requiring permanent staff to shift time away from project management, restoration planning, and other high-value work. Reduced seasonal staffing would limit the Unit's ability to support research, volunteer, and conservation partnerships, diminishing our effectiveness as a collaborative partner and slowing progress toward long-term natural resource management goals.

Seasonal Temp Work Categories	Five-Year Budget	Estimated Seasonal Temp Cost
Volunteer Engagement (minus plant propagation)	\$30,000	\$110,000
Wildlife and Vegetation Monitoring	\$20,000	\$435,000
Wildlife Projects	\$65,000	\$110,000
Greenhouse Operations and Native Plant Propagation	\$125,000	\$540,000

Figure 32: Seasonal Temp Estimated Five-Year Budgets and Costs

The Parks department will evaluate organization of the Natural Resources Unit as the system grows and responsibilities increase.

Staffing Ratios

Natural Resources Specialists oversee the core function of managing restoration projects. Based on past performance, approximately 40 percent of specialist time per year can be devoted to managing new projects and initiatives. Ongoing activities typically account for 60 percent of a specialist's time and include vegetation management, monitoring, deer hunt, volunteer, and administrative tasks such as trainings and seasonal staff oversight.

Further study of staff time allocations is recommended, to develop staffing ratios that meet current demands, allow for growth in the system, and leave adequate time for addressing emergent issues (Strategy OP6d). Acres managed per specialist for different project types would be one logical metric for new restoration projects and ongoing management of restored lands. Additional metrics would be needed for tasks that are not based on acres, such as wildlife projects, water quality partnerships, and coordination of volunteers.

Addressing System Growth:

The following table demonstrates growth in the Dakota County Parks System and protected lands since 2017, with future estimates based on the 2050 Parks Vision Plan and other sources. Park acres reflect land within boundaries, excluding water and private park inholdings. Since 2017, several inholdings have been acquired and nine County Park Conservation Areas (CPCAs) have been added. All parks except CPCAs have NRMPs. Future new large parks may not be feasible, so a small increase is included for future parks.

Greenways are shown by length, although greenway NRMPs develop restoration and management recommendations for the greenway corridor as well as adjacent non-County lands such as city parks and private lands. The County currently assists with restoration of non-County lands along a greenway and generally has not participated in the long-term management. Adopted NRMPs for five of the ten master-planned greenways address nearly 2,000 acres of corridor and adjoining lands.

Natural area easements can be more difficult to project since participation is based on landowner interest. An estimate based on recent program performance is 20 projects over the next decade, with an average

size of 34 acres. Natural area easements did not require implementation of an NRMP until 2015. The County assists with easement restoration costs and has not participated in long-term management.

Unit Type	2017	2026	Estimated 2036	Planned NRMP Acres, 2026
Park	5,525 acres	6,009 acres	6,200 acres	5,005
Greenway	34 miles	69 miles	90+ miles	TBD*
Natural Area Easement	1,595 acres	1,986 acres	2,666 acres	730

Figure 33: Table Showing System Growth

*Greenway NRMP acres include the trail corridor plus adjacent lands with an opportunity for greater ecological restoration. The County is responsible for long-term management in the actual trail corridor. The County assists with restoration costs on adjacent lands in partnership with cities and landowners through formal agreements (e.g., easements and Joint Powers Agreements).

The Vision Plan calls for a total of 258 miles of greenway, which includes 107 miles of corridor search areas, shown as orange lines on the following map.

New park search areas (pale orange) are in the more developed areas of the County and would likely be constrained in size compared to the County's parks in rural areas.

As the system grows and projects increase, additional staff would be needed to maintain the current staffing ratio and capacity, and to protect past investments made in restoring the system.

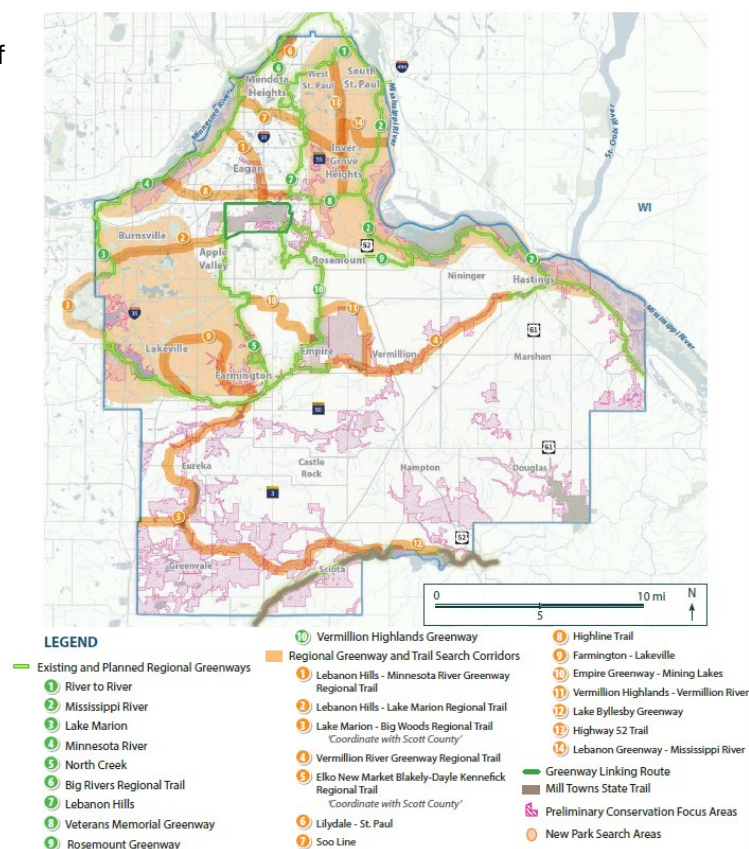


Figure 34: Park Search Areas and Potential Greenway Corridors

Additional Skills

The Natural Resources Unit and the Parks Department have grown to meet increasing demands placed on the system by increased visitation and public expectations for stewardship of natural resources. With this growth, additional skill sets may be desirable:

Communications: To manage social media and other public communications for ongoing work and special initiatives.

Data Analysis: The NR unit collects large amounts of data in their work, particularly through initial assessments and long-term monitoring. Having more timely analysis of data would enhance long-term adaptive management and reporting of metrics. Having/designing accurate and easy-to-use data recording systems could be part of this skill set. These skills would also apply to the design, tracking, analysis, and synthesis of metrics for Visitor Services, Greenways, and Parks Administration.

Stewardship Coordination: To recruit, train, and organize landowners and volunteers to assist easement landowners with NR activities, reducing the need for County resources to manage eased properties. This skill set would also be helpful in recruiting, organizing and training park volunteers.

Aquatic Ecology: Expertise in this area is lacking and management of surface water in parks has been complex, involving several partner departments and organizations.

Volunteer Coordination: Parks would benefit from volunteer coordination skills for Visitor Services, the Natural Resources Unit, and Greenways.

B. Partnerships

The Parks Natural Resources Unit has built strong partnerships with other County departments, affiliated external agencies, and organizations. The strength of partnerships can be thought of as doing “more with more” – working with others with shared goals to accomplish more than can be done as a single entity. An example of a strong working partnership is with the Dakota County Soil and Water Conservation District (SWCD), which develops and implements easement Natural Resources Management Plans and monitors easements. SWCD is a trusted and respected organization that also conducts extensive outreach to landowners, particularly agricultural operators, on best management practices, water quality, and land protection.

Good partnerships can expand staff resources and expertise, funding, equipment and other material resources, and leverage additional relationships. Good partnerships are grounded in shared goals and values, clear roles and expectations, complementary skill sets, regular communication, trust, and respect.

Dakota County has strong working partnerships with a wide variety of organizations, including:

- Universities and research institutions
- Federal agencies
- State agencies
- Met Council
- Tribal Governments
- Dakota County Department (Transportation, Water Resources, Parks Visitor Services, Greenways)
- Other counties
- Dakota County Soil and Water Conservation District
- Watershed management organizations
- Cities and Townships
- Nonprofit conservation organizations
- Local conservation groups

This plan calls for building new relationships.

- Indigenous Traditional Ecological Knowledge and Cultural Resource Planning
- Schools
- Other organizations, including businesses and industry

9. Public Information, Education, and Volunteerism

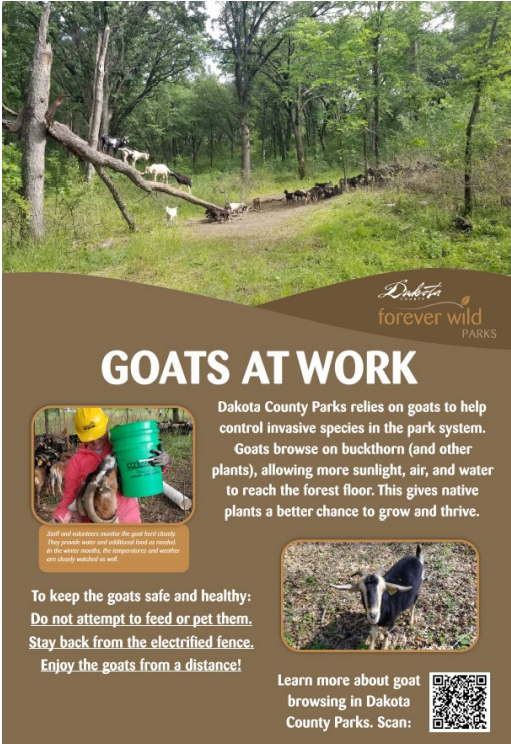
Public communication is essential to explain why natural systems require management and how the County stewardship programs work. It can also allay potential concerns about specific management activities, such as tree removals, and provide information that residents can apply to their own properties.

A. Communication Methods

Communication methods currently used by the Parks Natural Resources and Land Conservation Unit include:

- County website updates
- Listserv news items
- Social media updates
- On-site signage explaining a stewardship project
- On-site signage for conservation easements
- Occasional news media updates
- Targeted neighbor mailings about specific projects adjacent to their neighborhood
- Targeted outreach to private landowners related to conservation easements
- Regular outreach to park inholding owners about opportunities to sell land to the County
- Tours, such as the Bison Range and Greenhouse





GOATS AT WORK

Dakota County Parks relies on goats to help control invasive species in the park system. Goats browse on buckthorn (and other plants), allowing more sunlight, air, and water to reach the forest floor. This gives native plants a better chance to grow and thrive.

To keep the goats safe and healthy:
Do not attempt to feed or pet them.
Stay back from the electrified fence.
 Enjoy the goats from a distance!

Learn more about goat browsing in Dakota County Parks. Scan:





RESTORATION IN PROGRESS

Look around you—this park was once covered by a mosaic of prairies, savanna, and forests, home to many hundreds of plant and animal species.

Over the next few years, you will notice changes as we restore this area back to what it was, removing invasive species and returning ecological processes such as prescribed fire.

With the help of volunteers and grant funding, Dakota County Parks is working to restore these habitats.

Learn more about this project and how to become a volunteer by visiting www.dakotacounty.us/parks

On-site Educational Signage

B. Communication Plan

The Land Conservation Program follows a communications plan for outreach to landowners and public information on the program. The plan has been in place for more than a decade and is updated periodically in collaboration with the County Communications Office. The plan addresses key audiences and primary messages and lays out a schedule for reports, social media, earned media, mailings, newsletters, and events.

This plan recommends that a similar comprehensive communication plan be developed for the Natural Resources Program. Public interest in wildlife, plants, and water is strong and the Parks Natural Resources Unit can share more information on the rich diversity found in Dakota County Parks.

C. Public Education

Dakota County Parks has a robust Outdoor Education (OE) program, which provides opportunities to learn about nature and outdoor recreational skills through classes, programs, and interpretive displays. OE and NR staff meet regularly to identify opportunities for collaboration which further the goals of both program areas.

Example programs include:

- Bison range tours
- Junior Naturalist Camps
- Saw Whet Owl Banding, in partnership with Carpenter Nature Center
- Outdoor Career Success
- National Public Lands Day
- Foraging Native Plants



Saw Whet Owl

D. Volunteerism

Volunteerism is essential for Dakota County's natural systems stewardship program. Volunteers generously gave 5,331 hours of their time in 2025, with participation from 1,102 volunteers. Their contribution has advanced the Natural Resources Unit's work, helping to improve many acres of parkland. Volunteerism can increase public interest in parks and open space and builds community.

With the addition of a large-scale greenhouse, Dakota County is producing native plants grown from seed collected in the parks. Volunteers have been an essential part of this program, which has moved from starting seeds on sunny windowsills in volunteers' homes to a temporary hoophouse and on to the greenhouse.

Current volunteer natural resources activities include:

- Seed collection
- Invasives removal
- Propagation of native plants
- Wildlife surveys (Breeding Bird Survey, turtles, dragonflies)

It is important to provide volunteers with appropriate types of work, for safety and other reasons. The following table rates suitability of different resource management tasks for volunteers.

Tasks	Generally Appropriate	Appropriate with Oversight and Training	Generally not Appropriate
Native seed collection & sowing	X		
Installation of live trees, shrubs, herbaceous plugs	X		
Hand-pulling invasive plants	X		
Dragging buckthorn/brush	X		
Cutting buckthorn/brush		X	
Simple ecological monitoring		X	
Mowing			X
Herbicide application			X
Prescribed burning			X
Slope stabilization			X
Construction of water projects and best practices			X
Technical ecological monitoring			X

Figure 35: Table Characterizing Volunteer Tasks

Dakota County offers different levels of commitment for people interesting in volunteering. Short-term opportunities are regularly offered, in addition to more intensive ongoing commitments. Dakota County Habitat Stewards program supports the county's work of protecting and enhancing the environment. Throughout the year, Habitat Steward volunteers collect native seeds, plant new seeds, create new plants through propagation, help in the county greenhouse and much more. The following table differentiates between single and ongoing volunteer commitments.

Characteristics	Single Commitment	Ongoing Commitment
Tasks Tasks should be reasonable and safe, and all necessary personal protection equipment (work gloves, etc.) should be provided.	Requiring a training period of ten minutes or less. Examples: hauling brush; planting plugs, trees, etc.; pulling invasive species, focusing on a single species within a defined area	Requires a longer training period or learning curve. Examples: plant or wildlife inventory; invasive species mapping; supervising other volunteers; pulling invasive species, focusing on multiple species or working over a broad area
Scope All volunteers should be aware of how their efforts fit into the bigger picture	Narrow, simple and attainable While the broader project scope can be large, one-time events must have a definite goal /boundary, and volunteers must be able to accomplish the work within the set time period of the event.	Complex and progressive While these efforts may have a clear objective, it may be impossible to attain an end goal. Volunteer expectations must be managed so that they understand that their work is resulting in progress.
Volunteer Commitment	Low – Volunteers commit to two- to three-hour time blocks.	Medium to High – With additional training, volunteers are asked to commit more time.
Staff Commitment	Moderate – Much of the staff effort is dedicated to volunteer recruitment and event logistics.	High – Beyond recruitment and logistics (which may be more challenging), staff must also work toward training, retention, and appreciation.
Performance Metrics	Successfully completed projects often result in very tangible results, such as cubic feet of brush hauled, number of plants installed. Volunteers can accomplish much in a short period of time.	Due to the nature of these projects, results may be more difficult to quantify. However, these volunteers are often required to perform their task at levels equivalent to County staff.

Figure 36: Table with Single and Ongoing Volunteer Commitments

Effective use of volunteer labor does require staff time for coordination, training, and oversight, but remains a strong “net positive” for the County’s work.

Metrics for Volunteerism

While the number of volunteers engaged or number of hours contributed are useful measures of program success, they should not be over-emphasized. Factors of weather, the availability of appropriate work, and staff resources for coordination influence these metrics from year to year.

Volunteer retention is another important metric in measuring program success. High retention rates can indicate that the program provides a consistently high-quality volunteer experience. As one-time volunteers develop a relationship with the County, they may become more interested in taking on additional responsibilities and move towards high value, “steady” volunteer positions. Volunteers who have several high-quality experiences are also more likely to tell friends and family about the program. Word of mouth recruitment can greatly increase the County’s overall volunteer pool.

Finally, when considering volunteer engagement goals, it is important to recognize that volunteer availability is finite and that there are multiple competitors in the local volunteer engagement market. Within this competitive market, a sustainable volunteer program must be responsive to the interests of participants.

Volunteers may assist with a particularly monotonous activity on an occasional basis, but they are less likely to remain engaged if that activity is all that is offered. For example, while there appears to be an endless supply of buckthorn seedlings for volunteers to pull, it is unlikely that the County can engage a volunteer workforce capable of completing this entire task.

To maintain volunteer morale and engagement and to ensure that natural resource goals are met on such projects, it is essential that contractors or other labor sources are available to supplement volunteer efforts.



Volunteers Planting at Buck Pond, Lebanon Hills



Volunteers pulling garlic mustard at Lebanon Hills Regional Park

10. Additional Issues

Several issues that have emerged will merit watchful attention and further efforts throughout implementation of this plan. While most appear as threats, they also can offer opportunities for improved methods that can have broader application than the initial problem.

Strategies will be added or adjusted, as needed, consistent with the Adaptive Management Model that informed the direction of this plan.



Figure 37: Adaptive Management Cycle

Climate Impacts

This plan suggests two paths for addressing climate impacts: mitigation (reducing emissions and sequestering more carbon) and adaptation (building resilience for the present and coming changes). Preliminary greenhouse gas inventory data suggest that it may not be possible to “sequester our way out of the problem” by restoring more natural systems on protected land, but more can be done to improve the resilience of our natural systems. Staff will continue to monitor research from universities and agencies and incorporate emerging best practices.

Wood Waste

The Twin Cities Metro Area is approaching “peak disposal” of wood waste related to Emerald Ash Borer and the massive loss of ash trees. Additional wood waste results from an increasing number of severe storms. Metro disposal systems are near capacity for handling this waste, whether through burning wood for energy, use of the wood for fabrication, and other sustainable disposal options. Although biochar has been used successfully in Dakota County’s parks and reduces GHG emissions over open burning, it is confined to use on wood waste of specific dimensions. Staff will continue to track the issue and look for innovative and sustainable solutions.

Exotic Invasives

While much attention has been paid to invasive plant species, invasive non-native insects such as Emerald Ash Borer and other insects pose a great threat to many native tree species that are highly vulnerable. While infestations of Spotted Lanternfly are confined to eastern states, the potential for spread to the Midwest is present. Plant diseases that are new to this region, often fungal, are also a concern as Minnesota’s climate changes to wetter and warmer. Staff will continue to monitor research and guidance from state and federal agencies on methods to curtail the spread of invasive species and diseases.

Financial Concerns

Budget uncertainties are a certainty, nearly guaranteed to occur over the life of many long-range plans. Finding sustainable long-term funding and incorporating flexibility to adapt methods and schedules will remain critically important to protect past investments and continue making progress.

Appendix A: Dakota County's Natural Resources

1. Geologic History

The Wisconsin glaciation ended about 10,000 years ago and created the region's major landforms. The glaciers left a rolling and hilly landscape with lakes and wetlands in depressions. Soils formed primarily from sandy and gravelly glacial outwash on level plains and are well drained. Other deposits called moraines appear today as mounds of mixed-up rock, gravel, sand and clay, with low spots—or "kettles"—and are common in the northern and western portions of the County.

2. Vegetation and Ecological Regions

The County's natural resources are shaped by their ecoregion context, landscapes with similar characteristics as defined by the Minnesota DNR. The County is in the Eastern Broadleaf Forest province with two sections: Paleozoic Plateau and the Minnesota and Northeast Iowa Moraines. Within this context, the County includes the five subsections described below, which makes it one of the most ecologically diverse counties in the state.

The County's five ecological subsections are described below and shown in the following graphic.

- **St. Paul-Baldwin Plains.** Northern County. Soils are clay loams, loams, sandy loams, and loamy sands and historically dominated by oak and aspen savanna with tallgrass prairie. Maple-basswood forest was common in fire-safe areas. Fire was an important natural disturbance. Today, the subsection mostly consists of urban and suburban land uses.
- **Big Woods.** Western County. Soils are loam to clay loam, which are productive for farming. Lakes are common and maple-basswood forest and oak woodland prevailed. Fire was infrequent. Today, over 75 percent is cropland and pasture.
- **Oak Savanna.** Central County. Soils are varied, lakes are uncommon, but wetlands were once common. Historically, bur oak savanna dominated with tall grass prairie, and fire was an important disturbance. Today, almost all prairie and wetlands have been lost, and land use is dominated by farming, with suburban development advancing from the north.
- **Rochester Plateau.** Southeastern County where glacial deposition is thin and bedrock exposures are common. Sensitivity to

groundwater pollution is high to very high. Soil types vary and lakes are uncommon. Historically, tallgrass prairie and bur oak savanna covered the area, and fire was a key disturbance. Today, it is mostly farmed.

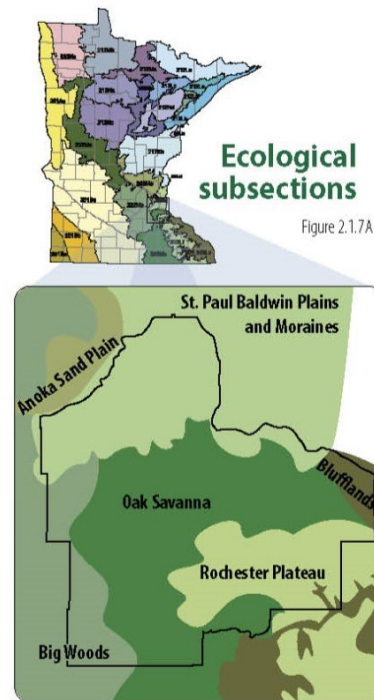


Figure 38: Ecological Subsections in Dakota County

- **The Blufflands.** Eastern County, mostly along the Mississippi River valley. Slopes are steep, and soils vary. There are no lakes, except old oxbows in river floodplains. Historically, tallgrass prairie and bur oak savanna were on ridges and upper slopes, and various forest types on moist slopes and in valleys. Fire was important in upland prairie and savannas. Today, half is farmed or pastured, and woodland and

forest is interspersed with low-density housing. The former Mississippi River floodplain has been greatly altered by a series of lock and dam-created pools constructed during the 1930s and 1940s.

3. Water Resources

Most of the County was under glacial ice until about 10,000 years ago, creating outwash plains; hilly, lake-studded moraines; rocky outcrops; and deep river valleys. Glaciers also left abundant water resources, from the Minnesota and Mississippi Rivers and lakes in the north and east (Figure x), to the Vermillion River that divides the County, and the many small trout streams to the south.

In the north, the Mississippi River passes through a narrow gorge in Minneapolis and then becomes a wide floodplain and backwaters further downstream. The wide Minnesota River Valley joins the Mississippi River at Fort Snelling. Together, these rivers form the largest, most continuous natural area in the Twin Cities. The floodplains and bluffs are preserved by the Mississippi National River and Recreation Area (MNRRA), the State Critical Areas Act, the Minnesota River Valley National Wildlife Refuge, Fort Snelling State Park, and Lilydale Regional Park. The Cannon River, with trout stream tributaries, has strikingly steep and rocky valleys. The Vermillion River and its tributaries meander through the central County, dropping over Vermillion Falls in Hastings on its way to the Mississippi.

A. Wetlands

Wetlands are often thought of as marshy areas with ducks and cattails. Many wetland types exist in the County; some resemble small lakes and others may be dry for most of the year. Some wetlands support trees and shrubs, and some may be farmed.



Diverse variety of wetlands found in Dakota County

Historically, wetlands were considered wasted space and were drained for crops and development. In Minnesota, an estimated 11 million wetland acres (60 percent) were lost during the past 150 years, leaving about 7.5 million acres. In Dakota County, over 85 percent of the historical wetlands were drained or dredged. Today, most of the County's wetlands are in its northwestern third with few existing elsewhere.

The historic loss of wetlands has consequences for water resources. Wetlands can maintain stable, clean water resources by storing excess water during floods and by filtering sediments and nutrients before water enters lakes, rivers and streams. Wetlands also provide wildlife habitat and public recreation opportunities.

To preserve wetland benefits, the Minnesota Legislature enacted the Wetland Conservation Act (WCA) in 1991. The WCA gives authority to local governments to enforce the nation's wetland laws and prevent further loss and damage. The Dakota County Soil and Water Conservation District (SWCD) assists cities, townships and individual landowners in determining if an area is a wetland. SWCD staff also provides technical support and act as an information clearinghouse for government and residents who have questions about wetlands and water resources. Any project that would damage or destroy a wetland requires a permit from federal, state, and/or local agencies.

Monitoring water quality to ensure that it meets the needs of Minnesota’s residents is an important function of state and local government. The County has monitored wetlands through the Minnesota Pollution Control Agency’s (MPCA) Wetland Health Evaluation Program (WHEP) since 1997, with volunteers monitoring 212 wetlands, visiting many of them multiple times each year. Their data has shown that wetland health varies greatly from wetland to wetland and in different areas of the County, with most wetlands having moderate health/functionality. Some wetlands, monitored for many years, show improving wetland health while others are declining.

B. Lakes

Northern Dakota County has many small lakes. Notable lakes with public access are Crystal Lake in Burnsville, Lake Marion and Orchard Lakes in Lakeville, and the nine lakes in Lebanon Hills Regional Park. Chub Lake in Eureka Township is in the southwestern County. Lake Byllesby at the County’s southern boundary is a dammed reservoir on the Cannon River. Spring Lake at the County’s eastern border was a natural oxbow lake and marsh of the Mississippi River but was submerged by the 1930 Lock and Dam Number 2 at Hastings. Lake Byllesby and Spring Lake have public access.

Most of the lakes in or adjacent to County parks, greenways, or easements are shallow, with standing fresh water to a maximum depth of 15 feet. In shallow lakes, more than 80 percent are typically shallow enough to support emergent and submerged rooted aquatic plants. In general, shallow lakes tend to be more nutrient rich than deep lakes and often have lower water clarity.

Lebanon Hills Regional Park has the most lakes in the County parks system, with ten lakes greater than ten acres and many small open water or vegetated wetlands. These are “kettle lakes” formed in depressions in glacial material. Visitors enjoy lakes for fishing, swimming, paddling, and wildlife watching. A designated canoe portage route passes through several lakes.

Most lakes in the parks are mesotrophic to eutrophic according to the Mn DNR’s 2025 Trophic State Index (TSI) scores, meaning that clarity is low, nutrients are high, and vegetative growth can be abundant. TSI scores range from 0 to 100. For detailed information on individual lakes, refer to the NRMP for the specific park or greenway.



Portage Lake, in Lebanon Hills Regional Park, Eagan, MN

Lake	Size (acres)	DNR Water Quality Score and Grade	Watershed Area to Lake Area	Trophic state Index
McDonough (Lebanon Hills RP)	18	75, B+	2.8	55
Holland (Lebanon Hills RP)	38	55, C+	84.6	42
Schultz (Lebanon Hills RP)	13	65, B	142	53
Jensen (Lebanon Hills RP)	54	-	-	53
O'Brien (Lebanon Hills RP)	33	70, B	26	48
Gerhardt (Lebanon Hills RP)	-	-	-	60
Thompson (Thompson CP)	8	50, C	9.7	62
Byllesby (Lake Byllesby RP)	1,368	25, D	535	68

Figure 39: Water Quality Indicators for Park Lakes

C. Rivers and Streams

Rivers and streams are prominent features of the County's parks, greenways and easements. The Mississippi River flows next to the Mississippi River Greenway and Spring Lake Park Reserve. The Minnesota River is adjacent to the Minnesota River Greenway. The Cannon River is the main feature of Lake Byllesby Regional Park and flows by Miesville Ravine Park Reserve. Portions of the Vermillion River and its various tributaries flow through the two County Park Conservation Areas and several natural area and agricultural conservation easements. Trout Brook, a tributary to the Cannon River, bisects Miesville Ravine Park Reserve, and three other creeks (Chub, Pine and Spring Creeks) flow among and through several conservation easements.

D. Groundwater

About 90 percent of the County's drinking water comes from groundwater, either from municipal wells or private domestic wells. Remaining needs are supplied with surface water through the St. Paul Regional Water Service.

Lakes, streams, wetlands, and fens also depend on groundwater for their existence. Wetlands and surface waters are the groundwater made visible—the surface expression of the groundwater table. Groundwater sometimes provides a stream's base flow of steady-flowing, cold water despite summer heat and drought. Trout streams and other fisheries need stable groundwater. In the County's rare calcareous fens, the build-up of peat does not occur unless a continuous flow of cold, nutrient-poor groundwater flows through them. As an example, the tamarack swamp in Lebanon Hills Regional Park has likely been degraded because runoff from roofs and streets is diverted into storm drains leading to detention ponds, rather than penetrating the ground to recharge the groundwater feeding the swamp. Recharge is determined by the amount of precipitation flowing through soil to the groundwater table. It is affected by the amount of rain and snowmelt, the soil type and the land use. Experts estimate that 3 to 13 inches of precipitation recharge the groundwater in the County each year.



Trout Brook tributary, a groundwater-fed stream

Groundwater comes from two main sources: surficial aquifers in glacial drift/outwash, and bedrock aquifers in older, consolidated sedimentary rocks. Groundwater levels fluctuate seasonally and from year to year, especially in response to drought and increased water use. Surficial aquifers (in glacial deposits) are affected most by drought but respond quickly when rain returns. Deep bedrock aquifers fall more slowly but also take more time to recharge.

In the Twin Cities Basin, groundwater withdrawals may be exceeding the capacity of some aquifers to recharge. The DNR reports that County residents and businesses used about 23.7 billion gallons of

groundwater in 2024. Municipal wells, crop irrigation, and industrial processing are the largest use categories and generally draw from the Jordan aquifer. Private domestic wells use the Jordan and Prairie du Chien aquifers as well as surficial aquifers. When groundwater withdrawals combine with seasonal fluctuations, the decline in groundwater supply is noticeable. The Metropolitan Council groundwater model predicts the surficial aquifer and the Prairie du Chien-Jordan aquifer will fall significantly if current groundwater use trends continue. This may require a shift to other sources of water.

In addition to supply, the quality of groundwater is important. Drinking water supply is strictly regulated for public safety, although private well owners are responsible for their own drinking water quality. Groundwater quality can be affected by agricultural chemicals, industrial spills and natural contaminants. The City of Hastings, for example, is challenged by high nitrate and Per- and Polyfluoroalkyl Substances (PFAS) levels in its drinking water, with some private wells exceeding the 10 parts per million (ppm) drinking water standard for nitrates; above that level, infants younger than six months are at risk of developing health issues. The main source of nitrate is crop fertilizer; nitrate easily flows with water into the soil and is flushed into the aquifer by subsequent irrigation and rainfall. High levels of breakdown products from cyanazine, an herbicide that is no longer in use, have also been found in drinking water. Industrial spills, dumps, and commercial and private landfills historically contaminated groundwater in a variety of ways, but current industry standards have greatly reduced this type of contamination. Lastly, in the northern and western County, groundwater can have higher than normal levels of manganese and arsenic. PFAS chemicals have been an emerging quality issue in groundwater in the past decade.

Groundwater is a critically important natural resource and subject to change due to natural and human factors. Natural resource management on County lands and easements can preserve some groundwater recharge. However, natural resource management carried out on County-owned lands and easements will have little impact on the overall quality of the aquifers, because Dakota County owns only a small percentage of the total land area in the county and because the aquifers extend beyond county boundaries. It will require regional efforts to solve groundwater issues.

E. Watersheds

Dakota County's seven watersheds coincide generally with drainages of rivers and streams and are managed by the following six agencies:

- Black Dog Watershed Management Organization (WMO)
- Eagan-Inver Grove Heights WMO
- Lower Mississippi WMO
- Lower Minnesota Watershed District
- North Cannon WMO
- Vermillion River Watershed Joint Powers Organization (JPO)

Watershed Management Organizations

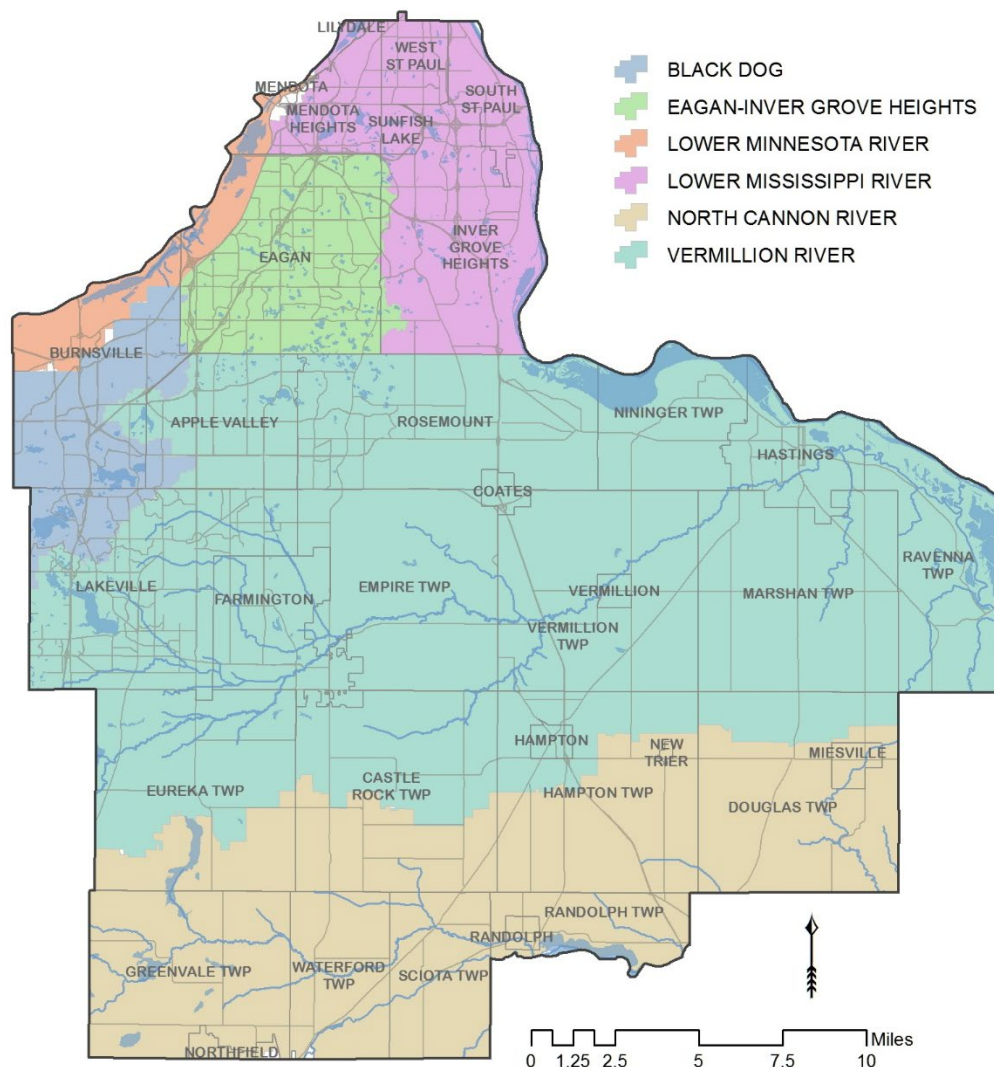


Figure 40: Watershed Management Organizations of Dakota County

Watershed organizations attend to the water resource needs and issues such as flood control, monitoring, water resource protection, and sometimes administering state laws (e.g., the Wetland Conservation Act) within their boundaries. The watershed organization may conduct monitoring or partner with cities, the County or the County Soil and Water Conservation District (SWCD). Each watershed organization has a management plan that determines how it will operate. The watershed organizations, together with the SWCD, are very active in monitoring and assessing water resources and in developing and implementing plans to protect and improve them.

F. Land Use Effects on Water Resources

Natural landscapes with intact native vegetation intercept and capture precipitation which reduces stormwater runoff. Water resources are generally stable and in good condition if the cumulative area of rooftops, pavement and cropland cover less than 10 percent of a watershed. When impervious cover and cropland are 10 to 25 percent or more of a watershed, water resources begin to deteriorate. Engineered curbs, gutters and sewers in urban areas, and drain tiles and ditches in rural areas effectively direct and convey stormwater away, but often carry spilled oil, heavy metals, bacteria, deicing salt, detergents, and

fertilizers. Pollutants of major concern are nitrate in groundwater, phosphorus in surface water, bacteria, and suspended sediment and microscopic floating algae (phytoplankton).

For the County's designated trout streams, maintaining cold groundwater recharge is a major concern. A "temperature trading study," completed by the Vermillion River Watershed Joint Powers Organization (JPO) in 2009, demonstrated that the key to preserving the necessary below-70°F temperature in trout waters is to percolate as much precipitation as possible into the soil so that groundwater is fully charged and continuously supplies cold surface water during critical times, such as hot summer months and drought conditions.

Excess water is also a problem when it arrives in streams and lakes. It creates a quick "bounce" in water level with each small rainstorm, damaging vegetation and exposing shoreland to the erosive force of water. When there is too much water for rivers and streams to carry, streambeds can also be scoured and banks can collapse, adding to the sediment load already in streams.

By using best management practices (BMPs), impacts can be reduced. BMPs include the following: using an ecological approach to manage stormwater runoff; ensuring that rain and snowmelt infiltrate into the groundwater; and filtering runoff before it reaches surface waters. These practices can help reduce the effects of development and agriculture. Without BMPs in watersheds where impervious cover and cropland total over 25 percent, water resources are greatly altered, suffering from "urban stream syndrome." They fill with sediment, have eroded banks and shorelines, experience algae blooms, and have poor water clarity. At the present time, the majority of the County's watersheds exceed 25 percent impervious cover and cropland.

G. Water Quality Standards

Water quality standards in Minnesota are established by ecoregion. An ecoregion's conditions influence water quality in lakes and streams. The U.S. Environmental Protection Agency's national ecoregion system includes the County in the North Central Hard-wood Forest, the Driftless Area, and the majority of the County, the Western Corn Belt Plains. Lakes and streams in the Corn Belt typically have higher nutrients levels and suspended solids than those in the Hardwood Forest or Driftless Area. Corn Belt streams tend to have higher bacteria counts. These differences appear related to extensive agricultural land use.

The Minnesota Pollution Control Agency (MPCA) recognizes these regional differences when setting pollutant standards for lakes and streams. Lake standards use relatively undisturbed situations, called reference lakes, for each ecoregion. Rivers and streams are classified as north, central or south and evaluated by those regions. The Corn Belt and Driftless Area are in the south region and the Hardwood Forest in the central region. Water standards for each region determine whether a water body or watercourse meets the standard, or its "intended, designated use."

Most lakes and streams in or near the County's protected lands are designated by state statute as cool and warm-water fisheries (2b) or having limited resource value (3C), which must be protected for aquatic life, recreation and industrial consumption. Some stream reaches are designated as cold-water fishery (1B, 2A), which are protected for household domestic uses and as trout streams. The MPCA also has standards for shallow and deep lakes. Shallow lakes are ecologically different than deep lakes and, in general, have higher nutrient concentrations and lower water clarity. When several water samples over a period of time falls short of the MPCA standard, a lake or stream is listed as "impaired" by the MPCA.

Data to assess the County water resources have been collected for many years and have been included in other plans and on the MPCA and DNR web sites. These waters were monitored and assessed to determine if they met standards for designated uses, such as drinking water or recreation. Draft data for 2026 shows that 21 of Dakota County's lakes and 27 stream or river reaches have impairments. For impaired waters, a study must be completed that identifies pollutant sources and develops a Total Maximum Daily Load (TMDL) plan for reducing the pollutant levels to state standards. Some impairment reduction projects are currently underway in the County.

Trophic state indicates how much plant and animal life (or biological productivity) is occurring in a water body. Carlson's Trophic State Index is an indicator that is calculated using phosphorus and chlorophyll-a (a measure of the green pigments found in algae) concentrations and Secchi disk transparency measurements, which indicate water clarity. Trophic state is not commonly used in flowing waters, so trophic ratings are not included for rivers and streams.

H. Aquatic Invasive Species

Aquatic invasive species (AIS) pose a significant threat to the County's waters. These invasive plants and animals can cause environmental and economic harm including smothering other desirable aquatic species, creating nuisance conditions for recreational boaters and swimmers, and damaging/clogging underwater equipment (e.g., water intakes). The most highly invasive AIS in waters associated with County parks, greenways, and easements are Eurasian watermilfoil and curly-leaf pondweed. Nearly half of the lakes monitored in recent years have light to moderate infestations of curly-leaf pondweed and infestations of Eurasian watermilfoil. While these invasive species present significant challenges, there are control techniques that reduce their negative effects.



Eurasian watermilfoil. Photo: US Fish and Wildlife Service



Curly-leaf pondweed. Photo: Minnesota DNR

4. Wildlife

Historically, a wide variety of wildlife was found in the County due to its diverse landscape, associated plant communities and abundance of water. There were prairies, savannas and hardwood forests, creating an entire range of tree canopy conditions. River floodplains and abundant depressions supported extensive lakes and wetlands. Most wildlife species have a preferred habitat, but many use several different habitats and at different times of the day and year. The combination and proximity of habitats allowed animals of the deep forest, open prairie, and unusual wetland habitats to co-exist near each other, expanding the number of animal species that historically lived in the County.

Big game species in the County once included bison and elk. Explorers and settlers in the 1800s saw bison grazing the prairie terraces near Fort Snelling. Nearly all early explorers from Radisson to Hennepin talked about their abundance. During the 1930s drought, numerous elk antlers were dug from shallow lakes in southern Minnesota. Hunting eliminated most large game, but agriculture also displaced bison and elk. White-tailed deer were also nearly extirpated, but institution of hunting regulations have since allowed them to thrive in the fragmented, agricultural landscape. Mountain lions were always rare, but black bears were very common in the 1800s. Occasionally bear and mountain lion are seen in the Twin Cities region, including Dakota County.

Fur-bearers existed in good numbers in Dakota County. Fort Snelling was built, in part, to regulate the fur trade. Over-harvest decimated beaver populations in the 1800s, and land use changes further contributed to their decline. Fur traders' records in the 1930s show that beaver, muskrat, and mink were harvested, with St. Paul being a regional hub for buying and selling pelts. Recent conservation efforts have allowed beaver numbers to rebound. Minnesota populations of opossum, striped skunk, and grey fox also have increased as trapping has decreased and habitat becomes more suited to generalist species—ones that can live in many kinds of places. Since 2024, three fishers have been radio collared and tracked in the County.

Currently, over 250 species of birds can be seen in the County, including bald eagles and peregrine falcons. At least fifty species of mammals and thirty species of reptiles and amphibians also make the County home. Animals that require special habitat or habitats damaged by development, agriculture, and pollution have been most affected by human activities—these include aquatic species that need clean water.

Pollution has altered populations of amphibians, fish and mollusks. As discussed above, agricultural and residential development upstream and adjacent to waterways has polluted and increased the amount of water in streams. Poor water clarity prevents predators from spotting aquatic prey. Point source pollution—from industry and wastewater treatment plants—has been reduced by the federal Clean Water Act, and water quality has improved since the early 1970s. Reducing non-point pollution caused by runoff from the land is more challenging, requiring shifts in land use and the application of stormwater BMPs. These efforts can, over time, greatly benefit wildlife that depend on clean water.



Blandings Turtle, U.S. Fish and wildlife Service



Prothonotary Warbler, National Audubon Society

Appendix B: Natural Systems Management

1. Background

Natural resource management emphasizes ecosystems, the living and the non-living parts of an environment, interacting and functioning together.

Ecosystems are always in flux, always responding to environmental change and evolving or “succeeding” over time. Organisms and the environment are bound together. Natural and human-caused disturbances often reset ecosystems to earlier stages. The changing climate and the introduction of new plants and animals can create both subtle and dramatic changes. Energy and materials such as nutrients and carbon move in different cycles.

Ecological restoration and management strive to understand how to help ecosystems recover after disruptions, and to understand the changes due to a changing environment. With that knowledge, natural resource managers apply various practices to improve the ecological health and long-term resilience of ecosystems.



Restored prairie in Miesville Ravine Park Reserve

Dakota County is dedicated to being a good steward of its lands and waters. Natural resource stewardship means taking care of the land and water despite past damage and future changes. Good stewardship includes maintaining, enhancing and restoring ecosystems to be well-suited to local conditions to ensure that plants and animals have the greatest chance of surviving and thriving. The County has been and will continue to promote ecological restoration to ensure natural resources are managed well.

Ecological restoration is the art and science of improving the natural environment by deliberately making the diversity, resilience, and natural functions of ecosystems more permanent. Scientific research has defined how ecosystems should be suited to local conditions and resilient. These healthy ecosystems have diverse and abundant native plant species, few or no aggressive non-native plants, diverse wildlife with important species reproducing, and abundant generation of ecosystem services. Restored aquatic ecosystems have high water in spring and summer, lower water in fall and winter, and slowly rising waters after storms.

2. Invasive Species

Managing invasive plant species is a priority challenge. These species often establish and thrive in disturbed habitats, usually crowding out native plants and animals. They typically have the following characteristics:

- Tolerant of a variety of habitat/environmental conditions
- Grow and reproduce rapidly, with good seed dispersion
- Compete aggressively for resources, such as nutrients, water, and (for plants) sunlight
- Lack natural enemies or effective competitors

Invasive plants can reduce plant diversity, degrade wildlife habitat and lessen resilience in the face of disturbances and environmental change. Controlling invasive plants is often the foundation of most ecological restoration and management efforts. Invasive animals (e.g., non-native earthworms) also have adverse effects. Some invasive species cannot be removed or cost-effectively controlled. In these cases, it is advisable to manage the effects of an invasive species, rather than try to eradicate it.

3. Pests and Diseases

Natural resources, such as forests, can also be affected by a variety of pests and diseases. Some of these occur as natural components of an ecosystem, but others have migrated into the region. The main pests and diseases that may affect the County's natural resources include:

- **Emerald ash borer (EAB).** Present on County lands and has had anticipated to have a devastating effect on the many mature ash trees growing throughout the region. The majority of ash trees in the County Park System have been impacted by EAB.
- **Oak wilt.** Present in the County, warranting special management of oak trees especially red oak species.
- **Spongy moth.** Present in the County, warranting special handling of cut wood and other surfaces where eggs may be found.

4. Management and Restoration Approaches

Natural resource management focuses on approaches that promote and maintain healthy and long-lived ecosystems across large areas or "landscapes." The composition, structure and function of these ecosystems may resemble earlier ecosystems, but they often cannot be re-created because conditions have changed too much. Natural areas and vital habitats have been greatly reduced and fragmented. Key plant and animal species may be missing. Natural processes such as fire and seasonal flooding cannot occur or may be suppressed. Rainfall patterns are different and changing. Exotic species have invaded.

Managers often based goals on conditions before the dramatic ecological changes that began in the 1800s and early 1900s. The thinking was that those ecosystems, mostly because they were largely intact, were resilient despite environmental change, had high biodiversity, and produced a variety of ecosystem services.

Recognizing that historical conditions were a moment in time, and conditions have greatly changed, managers today use that information to provide insights into what is possible but reproducing those historic conditions may not be feasible given other considerations.



Before and After: Typical Tallgrass Oak Restoration.

The large shifts that have occurred, together with changing site-specific conditions, often demote restoration of historical ecosystems. Management and restoration goals and activities must be grounded in realistic expectations for the restoration and improvement of vegetation, water and wildlife.

The first step in comprehensive natural resource management is to develop a Natural Resource Management Plan (NRMP). As discussed above, NRMPs focus on individual parks and specific places, describing the ecological surroundings of lands and waters, their current conditions, and proposed conditions. When implemented, the condition of land and water is shifted towards long-term ecological resilience or health, with a greater variety of native plants and animals, and potentially greater enjoyment by people.

An important outcome of an NRMP is the identification of a site's most important natural areas. Importance can be measured in terms of an area's quality, its rarity, its size and capacity to support specialist wildlife, and its value to people for unique experiences. The NRMP identifies these priority natural areas and provides recommendations for protection and improvement. Through identification, designation and management, the County can help assure that these special places will remain for future generations.

A. Restoration and Short-Term Management

Ecological restoration has short- and long-term management phases. The initial short-term, or “establishment” or “restoration” phase is the most time-consuming and costly. Usually lasting three to five years, a significant effort is needed to prepare and begin establishing native plant diversity types and ages for different management units. Tasks often include selective woody plant removal, controlling invasive species with herbicide, soil preparation, seeding and planting native species, re-establishing natural hydrological cycles in aquatic systems, reintroducing fire regimes in fire-dependent systems, and using bio-control techniques for invasive species management when available.

The length of time before moving from short-term to long-term management depends on many factors including the site's initial quality and other issues, weather conditions, how the site responds, size, and other complexities of the area.

“Enhancement” is a management term used to describe activities where minimal-to-moderate effort and cost is required to improve the resource. Adding more native flower species into a reconstructed prairie, or removing box elder from an oak forest, or planting native shrubs are examples of enhancements.



Before and After: Buckthorn Removal at Lebanon Hills

B. Long-Term Management

After short-term restoration goals are achieved, the process shifts to a lower cost, but equally important, long-term “maintenance regime.” These natural systems are not static. They are dynamic, influenced by natural disturbances, diseases, exotic invasive species, etc. Without commitment to long-term management, it is likely that short-term restoration improvements will be lost. Scheduling and budgeting for long-term management each year will protect the investment already made and ensure that the plant community and wildlife continue on a trajectory toward greater ecological diversity and health.

Long-term management tasks include spot-spraying herbicide on invasive plants, re-seeding disturbed or poorly developing areas, re-planting woody plants that have died, and maintaining appropriate ecosystem disturbances to perpetuate a diverse and resilient plant community. Most ecosystems need disturbances that remove dead plant material, regenerate many plant species, and open up new habitats. Controlled burns in fire-dependent communities (prairies, savannas, wetlands, and some woodlands) achieve this objective.

Harvesting hay from prairies, which mimics grazing, can also be effective. Much of the County 150 years ago was frequented by fires, and the plants and animals were adapted to those conditions.



Prescribed burn at a restored prairie in Lebanon Hills



Goats Browsing

C. Consequences of Not Managing Natural Resources

Studies over the last half century demonstrate that, without management, natural resources change in ways that are not always beneficial to people or supportive of ecosystem services. A common problem in many woodlands and forests in the County is invasion by exotic earthworms, common buckthorn and non-native honeysuckles. These non-native species invade natural areas, initiating a cascade of negative effects. Oak regeneration is suppressed, native shrubs decline, ground vegetation is shaded which leads to the loss of soil-anchoring plants and increasing erosion. Flower resources for pollinators are eliminated, reducing the amount and variety of food for other wildlife and depressing wildlife populations. Although very large and ecologically complex regions may resist this trend, natural resources generally decline in quality over time without proper management. This is especially true in small and scattered natural areas, which are common in Dakota County. With some level of management or with a

greater level management, the situation can be stabilized and even improved.

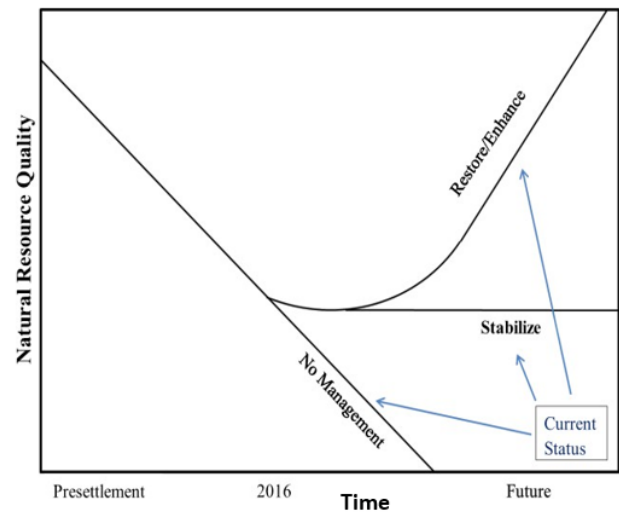


Figure 41: Natural resource quality over time related to management action

D. Core Habitat, Edge Effects, and Connections

Generalist wildlife species (e.g., crows, starlings, raccoons) are common animals that can tolerate and even thrive in altered and developed lands and waters. These species are not typically a focus of conservation since their populations are usually stable or increasing. In contrast, specialist wildlife species are often rare or have declining populations due to special habitat needs. Many specialist wildlife species require large, diverse and high-quality habitat blocks to sustain their numbers. These areas are called interior or core habitats. Protecting and managing core habitats in the County will improve the likelihood that uncommon and declining animal species will persist.

The DNR's Wildlife Action Plan (revised in 2025) identifies many of these at-risk species, which are called Species of Greatest Conservation Need (SGCN) for the ecoregions in the County. Many species identified as a SGCN can be present in

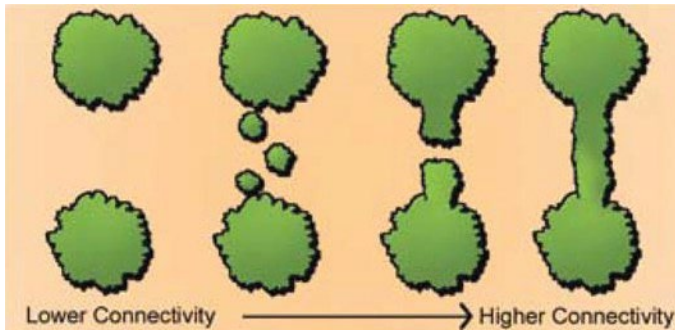
Dakota County Parks. An example is the Ovenbird (*Seiurus aurocapilla*), which is monitored by the MN DNR.



Ovenbird, a ground-nesting bird species found in woodlands

Connecting core habitats allows wildlife to move to different, more favorable areas, without being exposed to the hazards of travel. Only the largest parks and tracts of public lands generally support the County's most sensitive vertebrate species. Some of these require corridors of several hundred to thousands of feet

in width to move among large habitat cores. These ideal conditions are possible in only a few places like the Minnesota and Mississippi River Valleys. It is more practical to consider core habitats of 200 to 2,000 acres, with 200-foot- to 2,000-foot-wide corridors connecting the large cores. Larger habitat areas and connections also benefit many types of smaller animals. On the other hand, small habitat areas can sustain many invertebrate species which have small home ranges. Native vegetation can also benefit from connectivity as seed dispersal can be facilitated; however, this becomes a problem when invasive plants take advantage of these connections. Due to these variables, greenways (an important method of increasing connectivity) should be designed and managed thoughtfully to maximize ecological benefits and minimize adverse effects.



The concepts of core habitats, edge effects and connectivity can be used to help conserve the County's biodiversity. Protecting, connecting and restoring large areas of natural vegetation to minimize fragmentation and edge effects are critical to many SGCN surviving and thriving in the County

Figure 42: Gradients of ecological connectivity
Source: Conservation Buffers (Bentrup 2008)

E. Climate Change Implications for the County's Natural Resources

The effects of climate change are becoming more apparent in Minnesota. State climate trends showed that the average annual temperature has increased by over 2.6°F since 1896, and winter temperatures are rising more quickly.

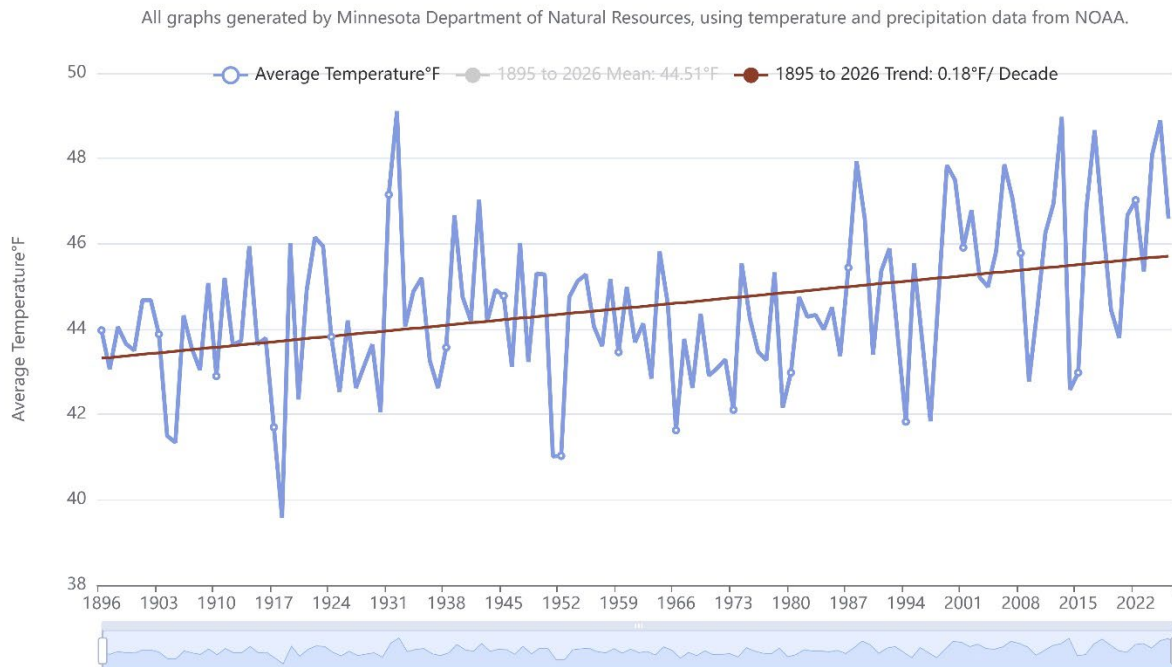


Figure 43: Annual average temperatures, 1896 to 2026

Extreme weather such as heavy rainfall of three or more inches is occurring more often in Minnesota. Rising temperature and increased precipitation has lengthened western Minnesota's growing season by two weeks compared to a century ago. The Third National Climate Assessment reports that, given current trends, spring and winter precipitation in the Midwest is expected to increase 10 to 20 percent over the next century, while temperature will increase approximately 3.8 to 4.9°F by 2065. Despite more rainfall, one climate model suggests that higher air temperatures may increase the frequency of drought in the Midwest over the next century. These climate projections could alter the County's natural resources and require adjustments in their management.

The County's forests will likely change in composition, productivity, diseases, and pest infestations. Many current forests are dominated by oak, basswood, and black cherry species that are expected to thrive in the future climate scenario for Minnesota. Ranges of shrubs like buttonbush, American bladdernut and eastern wahoo, and trees like Kentucky coffeetree, honey locust, swamp white oak, black oak, and chinquapin oak may expand northwards. On the other hand, species at the southern edge of their range (paper birch, tamarack, black ash, white spruce, jack and red pines, nannyberry, and speckled alder) will diminish.

Annual forest growth is expected to increase due to increases in carbon dioxide, precipitation and temperature. However, such conditions will also tend to favor exotic weeds, pests and diseases that thrive in warmer climates. Pests such as emerald ash borer and gypsy moth, and aggressive invasive plants such as kudzu and other honeysuckles, will most likely range northward. Drought episodes may become more frequent and severe, promoting a shift from mesic and wet prairie species to those adapted to drier conditions. Planting more native prairie and savanna would be a beneficial strategy to capitalize on this trend.

Natural resource management will need to adapt to climate change in the following ways:

- Change the timing and frequency of prescribed fire and invasive plant management
- Increase efforts to respond to greater invasive species pressure
- Change the timing of seeding and planting
- Use species and genetic plant material from southern Minnesota and Wisconsin, and northern Iowa and Illinois
- Address the implications of changing community and species ranges and composition
- Respond to the range of options related to persistence versus change.

Surface waters also will be affected. The County's water resources already are exposed to excessive runoff and high nutrient loading. Evidence of accelerating erosion is evident in ravines, especially in areas of older glacial drift in the eastern and southern portions of the County. Precipitation trends are likely to accelerate this erosion and increase nutrient loading to lakes and rivers. This, in combination with warmer water temperatures, can stimulate potentially toxic blue-green algae blooms. Shoreline erosion is likely to increase as well. With added sediment comes reduction in lake storage volume, which already occurs in the County's shallow lakes. Sediment can also bury or damage aquatic vegetation and gravel stream beds that are important in the life cycle of many fish and macroinvertebrates.

The County's trout streams are at risk from warming air temperatures because young trout cannot long tolerate water temperatures higher than 65-70°F. More frequent droughts are also expected to lower stream baseflow and lake levels. Discharge of cold groundwater (currently around 50°F) to trout streams may be reduced, raising stream temperature. To the extent that more rainfall is falling in these intense storms, and it is directed away in ditches and storm sewers, groundwater recharge will decrease. This shrinks the buffering effect of cold groundwater on the County's trout streams.

Water management strategies that can compensate for climate change are:

- Design stormwater best practices to reduce the erosive effect of intense precipitation events
- Reduce runoff volume by spreading many strategies across the landscape (e.g., cisterns, rain barrels, rain gardens, bioswales, infiltration basins)

- Infiltrate as much clean runoff as possible to recharge aquifers
- Increase shading of stormwater basins and cold-water streams
- Plan holistically at the watershed level.

Appendix C: Natural Resources Management Plans (NRMP)

Dakota County prepares individual Natural Resources Management Plans (NRMPs) for each of its parks, greenways, and selected conservation easements.

NRMPs are a proven method to guide ecological restoration and management of a particular site. Like periodically updated park long-range plans, NRMPs establish a starting point in a process to restore and manage sites towards improved ecological health. These plans aim to restore healthy plant communities. Their implementation helps protect the ecological integrity of natural areas, improve native plant diversity, enhance wildlife habitat, address erosion, improve stormwater management, enhance people's enjoyment of the site, and control long-term management costs. Long-term costs are reduced because the site is set on an ecological trajectory that will allow it to be more resilient and self-correcting in the future.

NRMPs typically describe:

- Goals for the site
- Information and methods used to develop the plan
- Existing ecological conditions (inventory and assessment)
- Desired outcomes (vision and goals)
- Prioritized restoration and management actions
- Management units
- Recommended schedule
- Performance standards
- Estimated costs

NRMPs also identify unique and rare flora, fauna, and natural communities present in each unit: the places that should be managed for resource values and left untouched by recreational development.

The best NRMPs are flexible. Ecosystems may not respond as expected. Weather is unpredictable. Funds may be delayed or reduced. Staff time may be reprioritized. New technology and scientific understanding may be gained. For these and other reasons, NRMPs must adapt and should be updated every five to ten years.

Successful natural resource management programs also regularly monitor and report on progress and then change if necessary. This feedback loop, called “adaptive management,” (Figure 27) generates new information that can improve management. It consists of a cycle of planning, implementation, monitoring, evaluation, adjustment, and more implementation, and should continue indefinitely. With expert guidance and supervision, County residents can help gather the data needed for adaptive management. Students, residents, and researchers can get involved which can increase understanding of and support for natural resource management.

Appendix D: Public Engagement Findings

1. Agency and Partner Meetings

Targeted stakeholder outreach was conducted in late winter and spring of 2026 among the following groups, to gain insight on shared issues and ways to improve partnerships.

A. Township Officers Meeting

March 14, 2026

Staff provided an overview of the Natural Systems Plan project for discussion.

B. State and Federal Agencies

March 18, 2026

Minnesota DNR

Summary:

- A potential land protection partnership could include expansion of existing sites.
- The County's greenhouse for propagating native species from local-source seed is a great opportunity. DNR staff is interested in working together to help DNR grow out their seed for DNR projects.
- DNR is expanding fall burns. They've found that spring burns can increase takeover by warm season grasses. They are removing tree lines on Vermillion Highlands, restoring more grasslands and are doing a burn on the north side of the Vermillion River, 250 acres. Cemstone is working with DNR on a 90-acre prairie restoration in a reclamation area. DNR is working with Pheasants Forever (PF) on Mud Creek, cutting trees and doing a burn. DNR is doing a burn and seeding on Clayton Savanna.
- Staff is interested in working more with Non-Game Wildlife on increasing habitat but is unaware of any wildlife reintroduction plans. DNR is installing bat houses on Vermillion Highlands. They're working with County staff on areas south of Whitetail Woods on the Vermillion River and with Pheasants Forever (PF) on wetland scrape-outs to aid the Blandings Turtle, which prefers wetter prairies. Sharp Tailed Grouse could be a candidate for reintroduction.
- Staff is interested in doing more wildlife surveys, especially on Vermillion Highlands. This could be a partnership opportunity. The State Herpetologist has studied Hognose Snake dens on sand prairies. The Smooth Green Snake has been seen along the Vermillion River. DNR is installing frog boxes at Gores Pool and have been mist netting bats at Vermillion Highlands.
- UMORE is being turned over to DNR in 2032. The U will retain some research plots on DNR land. DNR will acquire 1,000 acres to manage.
- Staff asked about cultural sites and discussed several surveys being done.
- DNR is not doing climate assisted migration work right now. They have collected acorns at Gores and germinated them in Missouri to ship back to Gores. They have two plots with the saplings.
- Funding has been reduced, resulting in less equipment than the other DNR departments that are funded by Outdoor Heritage. Vermillion Highlands is funded with the U of M. PF has been helpful for acquisitions and has worked with DNR in Scott and Carver counties. County staff are doing an LSOHC grant for acquisition and restoration and suggested DNR reach out if interested.
- DNR cannot purchase properties less than 150 acres unless they are adjacent to DNR lands. It can be a challenge for building connecting corridors. Local communities are interested in keeping lands on the tax rolls. Data centers and speculative land purchases for them have not been as much of an issue

as have the lands restricted through solar agreements. This has been more of an issue in the southwestern part of the state.

- Staff noted that they have too much warm season grass that they harvest (Indian grass, Big Bluestem) and asked if the County or MN Zoo might be interested in it as supplemental hay for bison.

C. Citizen Groups

March 23, 2026

Hastings Environmental Protectors (HEP)

Wilderness in the City (WITC)

Summary:

- Both groups find work in their areas and don't necessarily have long-range plans.
- Participants noted the benefit of a "middle" organization like Friends of the Mississippi River or Trout Unlimited working between the county and local environmental groups. These organizations can "plug in" local volunteers like HEP and WITC.
- Participants noted that the County Volunteer Coordinator does a great job of recruiting volunteers for stewardship events.
- County outreach to the groups on the types of work they support would be more effective than asking them to identify projects.
- The County could target more local objectives to bring in local volunteer groups.
- The draft plan could have less content on the two parent plans (LCP and NRMSP).
- Participants expressed support for the County's Habitat Stewards program.

D. County Parks Partners

April 17, 2026

Visitor Services

Outdoor Education

Facilities and Maintenance

Greenways

Summary:

- Staff asked how water resources fit into the Plan. Some lakes with recreational uses are filling in and have too much aquatic vegetation to support recreation. Parks relies on assistance from Water Resources and SWCD for water quality initiatives. There can be differences in ecological quality and recreational quality. Staff should track water quality initiatives for park lakes and should consider revisiting the lakes study at Lebanon Hills, done in 2017. Staff should also consider the National Park Service work on management for visitor use.
- Visitor Services staff would like deeper relationships with schools – how can Dakota County Parks be a resource to schools with creating habitat areas near schools as outdoor classrooms, libraries, too. Staffing is a limiting issue.
- People are interested in the research side of natural resources and want to know what the NR team is finding – we could do more to share with publications and communications. Parks could use more skills/staff in communications.

- NR staff collect a lot of data and could share more with the Outdoor Education (OE) team, in addition to using it to inform their own work. Analysis is key to synthesizing the data and learning from it. From the OE perspective, it would be useful to have analysis where education is planned, with more specifics than generic information.
- Volunteer coordination within the Parks Department is desirable.
- Would like to assist easement owners with management beyond initial restoration. Could work with a group like Prairie Enthusiasts to help landowners build capacity. This could be a full-time position.
- Would like more integrated events and opportunities such as seed harvest events.
- Collaboration during restoration can move other projects forward, such as trail maintenance. Staff should look for synergies.
- How the NR Unit can support Visitor Service goals: identify park campus areas or zones where NR and OE can co-develop projects to improve areas for outdoor education, such as prairie restoration projects. OE Staff would like to teach close to facilities and suggested educational landscaping around facilities, such as the back yard at the Lebanon Visitor Center. Staff should consider integrating Indigenous perspectives and managing landscapes for other groups to match their interests, such as foraging, weddings other events. More flowering forbs in the prairies around the Whitetail Woods camper cabins.
- How the Visitor Services Unit can advance NR goals: OE working more with the NR unit to weave elements of NR work into programming. OE could promote restoration projects at schools, if NR is able to support these projects.
- OE also can help communicate NR projects to increase public understanding of the work. NR projects currently have webpages and on-site sandwich boards. OE can help explain why the work is being done. Also need to provide info on timeframes – it can take a few years for an area to respond. Need a more strategic communication plan for natural resources.
- Improve coordination of development and restoration efforts. NR and cultural resources plans should precede long-range development plans, to identify sensitive areas that should not be developed.
- NR and VS can inform each other on annual workplans and coordinate more to avoid conflicts.
- VS staff like the dashboard idea, would need to identify the data that would be most useful and fill the gap in data analysis skills.

E. Implementation Partners

April 23, 2026

Friends of the Mississippi River
Great River Greening
Mississippi River Park Connection

Summary:

- Consider benchmarking.
- Look at potential roles for large industries located in the County. Some have supported the County's environmental projects.
- Although federal funds are constrained right now, there are still some funds out there to consider.
- Demonstrate staffing needs in terms of proposed acres being managed.

- Consider a mechanism for landowners to work together to restore and maintain their own lands. It could be facilitated by staff or an outside entity.
- Could the County consider easements on corporate landowners, especially adjacent to parks and greenways?
- Groups are seeing more interest from cities in having their own NRMPs and in Climate Justice Action plans. Interest in conservation seems strong in urban areas.
- Is there overlap or areas where we don't overlap and the County should focus efforts? While everyone is glad to see funding put towards restoration, communication from the County could be improved. The groups are interested in maintaining existing relationships with local communities and will be there to help them as long as they want, and more communication from the County would be helpful.
- Would the County support restoration on State lands such as Aquatic Management areas (AMAs) and Wildlife Management areas (WMAs)? These projects would be eligible for state funding. Barriers to doing this include staffing limitations for these areas and potential challenges in executing agreements with the State.
- County staff should look at the Hennepin County Natural Resources Partnership Coalition for ideas. Led by Three Rivers, Hennepin County and the University of Minnesota, it is looking at parts of cities, corridors, and existing plan priorities to create a system plan. The group is developing templates and work specifications that are shareable and useable by others. The effort was funded by the LCCMR.
- Collecting useful data and tracking over time is important. FMR maintains a contractor cost spreadsheet and updates it quarterly. It includes multipliers for complexities.
- Grant writing is another potential partnership opportunity with GRG, who does not bid on projects where they authored the grant request.
- Look into outsourcing data analysis (or AI).
- Outside funding may be available for some types of long-term adaptive management. Not clear if these kinds of proposals are competitive enough with initial restoration projects...
- Non-profit partners have more flexibility to get work done and can expedite some processes, such as bidding. Partners can explore alternative paths that are not open to the County.
- Bundling projects was discussed to expedite work, although County staff noted that this is not the norm. Staff are encouraged to seek Board approval for individual projects.

F. Water Resources Management

April 28, 2026

Dakota County Environmental Resources Department

Dakota County Soil and Water Conservation District

Vermillion River Watershed Joint Powers Organization

Summary:

- Staff suggest that the NSP remain at a high level on monitoring for water quality, with more detail provided in the NRMPs for individual park and greenway units. Parks staff currently work with SWCD and Water Resources on various monitoring efforts, such as Trout Brook in Miesville Ravine, Lebanon Hills, and Thompson County Park. Further discussion is desirable on which parameters should be

monitored. Parks should continue monitoring for recreational safety, such as bacterial counts at swimming beaches.

- Identify actions in plans to be able to budget for activities. There needs to be a clear connection.
- Agreement that the County has a skills gap in aquatic ecology. Could be added to Water Resources or to Parks.
- Which is the best entity to manage other water facilities (stormwater, wetland banks) that the County owns outside of parks, greenways, and easements? An example is a high-quality wetland south of Farmington that the VRWJPO has managed for six years. If this is a systems plan, it should address these types of resources at the highest level of service when budgets are sufficient.
- Dakota County doesn't have an overall surface water plan tying together its programs and responsibilities. The SWCD and individual watersheds are required to prepare plans. A County surface water plan would need further scoping and clarity on funding resources available to do the work.
- In addition to ecological and recreation management of surface waters, the NSP should address groundwater recharge. The CFAs don't line up well with recharge areas and more attention should be paid to Drinking Water Supply Management Areas (DWSMA). Funding for projects may be available.
- Outreach will be important for protecting groundwater quality. SWCD does extensive landowner outreach related to conservation practices that protect water quality. SWCD is a first point of contact and can steer landowners to different programs as needed. The Land Conservation Program would like more extensive outreach next year.
- Ecological lake health and natural successional processes aren't always compatible with recreational interests, such as paddling, swimming, and fishing. There is concern that some lakes in Lebanon Hills will no longer support desired recreational activities over time, as they fill in and become shallower, more vegetated. How can these different interests be reconciled? Should Parks do a comprehensive lake study like the Lebanon Hills Lakes study in 2017? Further review of individual watershed management plans could provide good information. Some watersheds prepare Adaptive Lake Management Plans, which the State requires for any in-lake treatments. Environmental Resources and Water Resources could provide technical assistance/lead Parks waterbody studies, with Parks securing the necessary funding. The upcoming Parks Visitor Services Plan should also address recreational uses of the lakes in Parks.
- Greater clarity on the different roles among the parties in the meeting related to water quality in parks was a shared interest. The NSP planning team will come up with a template to share with the group.
- Parks will participate in the periodic water resource partner meetings.
- Meaningful metrics that can be shared with the public and elected officials were discussed. A good example resource would be the recent reports for the North Cannon Watershed, which are very user-friendly. Metrics should be able to track trends – are things getting better or worse? The Lebanon Lakes study called for many projects that were implemented – how are they performing over time? The NSP should/could call for a comprehensive follow-up or an individual surface water study for each park and greenway. There is some data now, but it's not comprehensive. Studies should also inform management approaches.

G. City Parks Meetings

April 29 and 30, 2026

City Parks and Natural Resources staff from Apple Valley, Burnsville, Eagan, Empire, Farmington, Inver Grove Heights, Lakeville, Mendota Heights, Rosemount, South St. Paul, and West St. Paul

Summary:

- Cities with environmental staff report that they do a good job. The biggest constraint is adequate staffing to manage projects or take on more projects, not just funding. Adding staff is a challenge. Contracting work helps, but they contractors need oversight. It's often simpler to hire out the work but they have less control with contractors and costs can be higher due to prevailing wage requirements. It does avoid the need to acquire vehicles and office space for staff. There is capacity in the contractor pool if one can manage the costs of hiring them. Competition among qualified contractors is limited since their pool is somewhat limited in size.
- It can be challenging to demonstrate the value of stewardship, such as removing buckthorn. More education is needed once budgets improve. County residential surveys show that stewardship of protection of natural areas is a high priority for the public – do cities have similar surveys? Some do and it demonstrates support for their work. Projects sometimes have sticker shock, which can be difficult to overcome. Lakeville uses sandwich boards and videos to communicate natural resource projects with the public. They are more likely to receive calls if they aren't proactive with outreach on projects. Suggestion: collaboratively develop shared resource material for public education on the need for natural systems stewardship.
- Past collaborations with the County were viewed very favorably, a good experience. Burnsville worked with the County prior to the City County Conservation Collaborative (4C) and it went well. Flexibility in the workplan was important. Suggestion: the County wanted an NRMP in place before proceeding although the City has an adopted Natural Resources Plan. It was awkward to have two plans. County staff agreed that a simpler approach might suffice if grant requirements are met. Alternatively, Apple Valley found the NRMP for Alimagnet useful and are using it as a template for doing a city-wide plan.
- Participants were interested in when the next round of applications will be held. Staff anticipate sending a letter at the end of this year, an application round in July of 2027, and implementation in 2028. Staff are completing a funding request to the Lessard-Sams Outdoor Heritage Council (LSOHC.) Staff encouraged participants to provide letters of support for the program and funding requests. The County's upcoming Greenway operations plan will look broadly at funding, match amounts, and priorities.
- Current needs among the cities include approaches for tree removals and disposal of wood waste. Removal costs have increased, and disposal options are limited. Equipment and staff time are also constraints. Interest was expressed in using biochar kilns and the possibility of a larger biochar facility. Ash tree removals are a big push for Farmington. Contractors remove the trees, and the wood goes to sawmills or biofuel. The DNR website has a list of resources. Cities do get calls from concerned residents about dead trees near their property. Cities also get calls from residents who would like the wood for recreational fires, although the overall volume of wood is too large to make this a viable disposal option. Some cities are concerned about liability and legal issues in allowing residents to remove trees and usually leave the trees standing. County staff are watching progress on Washington County's funding request for a regional wood waste facility.
- Other issues include deer management. The County has conducted some support actions, such as survey flights. The more everyone addresses deer overpopulation, the better off everyone will be. Some cities do hunts or hire sharpshooters or a combination of both. County staff have been working with Three Rivers on developing a metro-wide data set and management approaches.

- Related to water quality, Burnsville has partnered with DNR on reintroduction of submerged aquatic native plants and is working on ways to scale-up lake restoration, including elimination of aquatic invasives. They are allowing people to collect aquatic natives from lakes that aren't infested with invasives. The County's new greenhouse has a section for propagation of aquatic plants. Staff support the idea of partnering with cities on plant propagation once the County can produce more than is needed for the County system.
- Lakeville and Eagan environmental staff are doing great work on water quality. Some lakes have come off the State Impaired Waters list. To date, the CCCC has had a limited role in water quality issues due to staff capacity challenges. County staff asked if the cities have Adaptive Lake Management plans.
- Climate is a topic of interest and the cities are following it. Wildlife impacts were raised by County staff along with the need for movement corridors. This will likely become a regional issue. County staff asked about high-mortality areas on roads. Suggestion: cities and county work together, looking at highly visible areas of interest to both.

Additional groups will be engaged throughout implementation of the Natural Systems Plan and/or in conjunction with engagement conducted with other related planning projects.

2. Residents

Public communications for the Natural Systems Plan included website updates with an invitation to send comments to staff at Planning@co.dakota.mn.us. No comments were received as of May 2026.

Public intercepts included interactive "dot boards" stationed at three Dakota County libraries and the Lebanon Hills Regional Park Visitor Center. Participants indicated what they value about natural resources in parks and their priorities for natural resource management work, using sticky dots to select their choices from a range of options. The boards were in place for three weeks in April 2026. A minimum of 266 people participated, based on the single response option with the largest number of dots across all venues.

Question 1: What do you value about natural resources in Dakota County Parks?

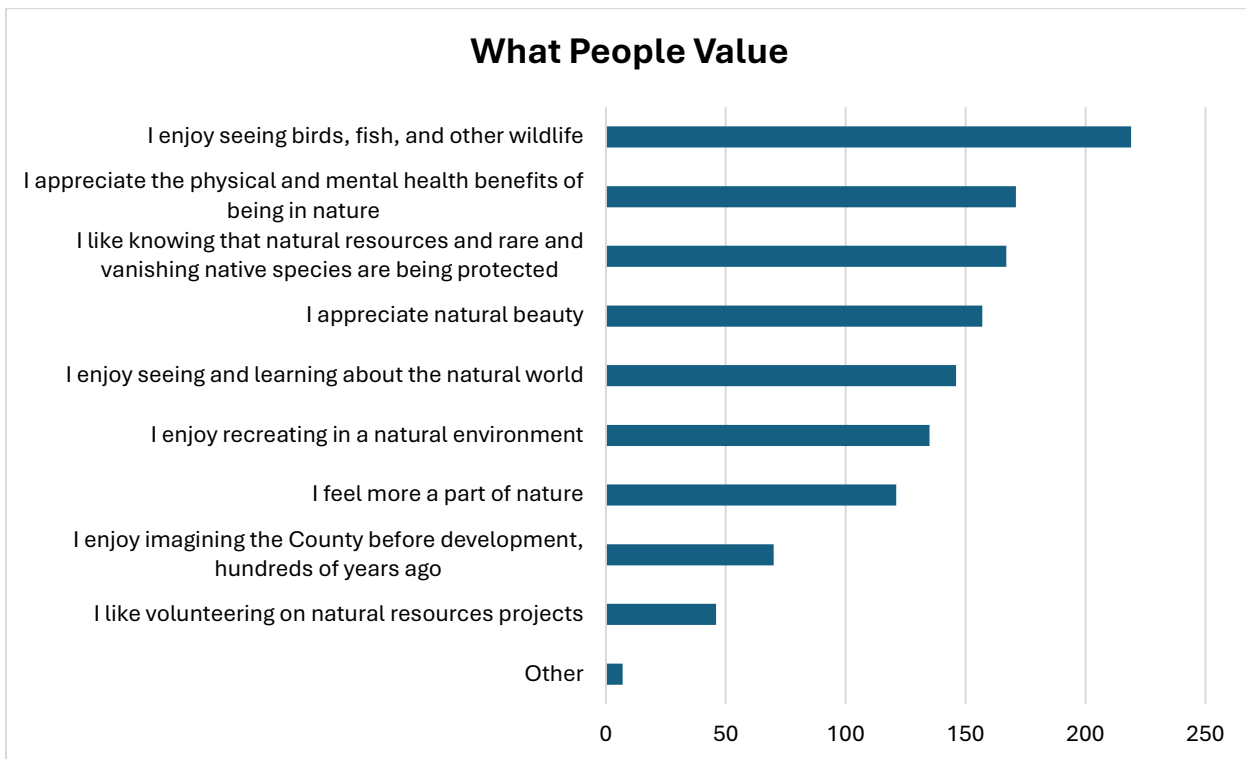


Figure 44: Bar Chart with Valued Natural Resources

Question 2: What are your priorities for natural resources work in Dakota County?

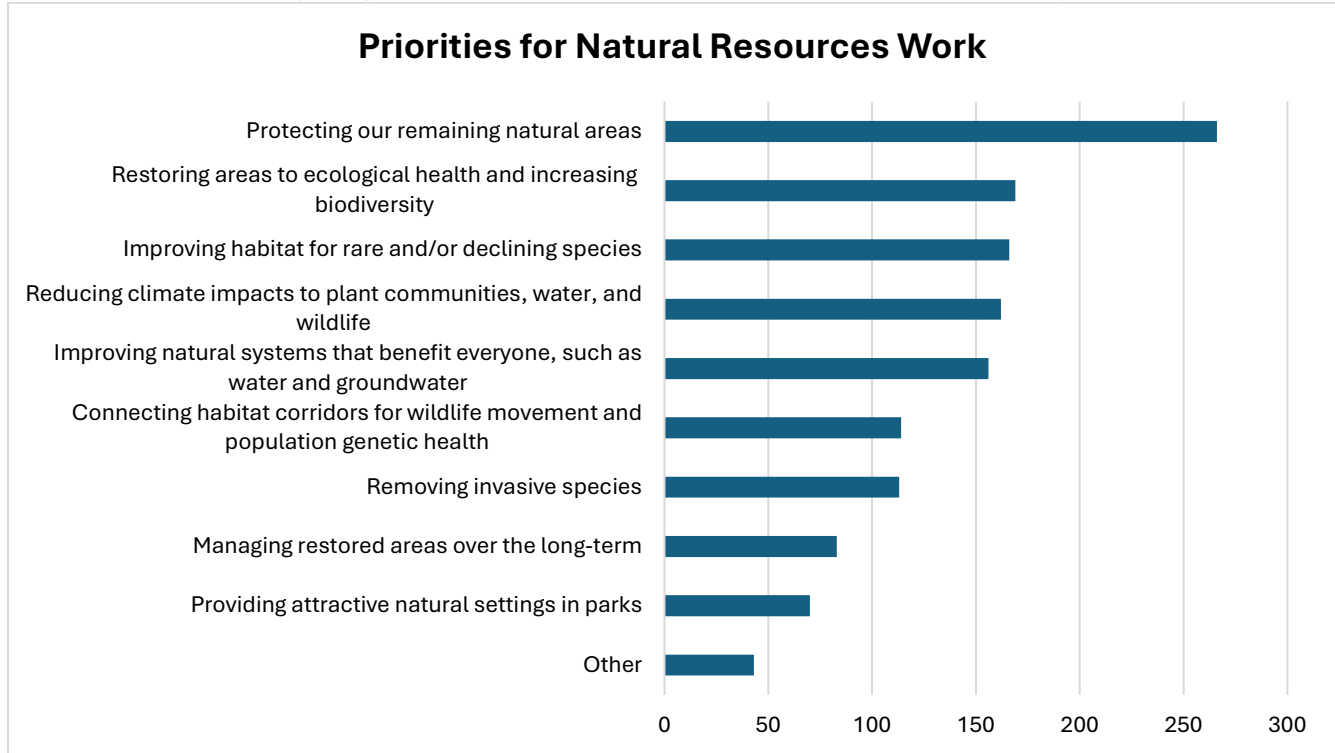
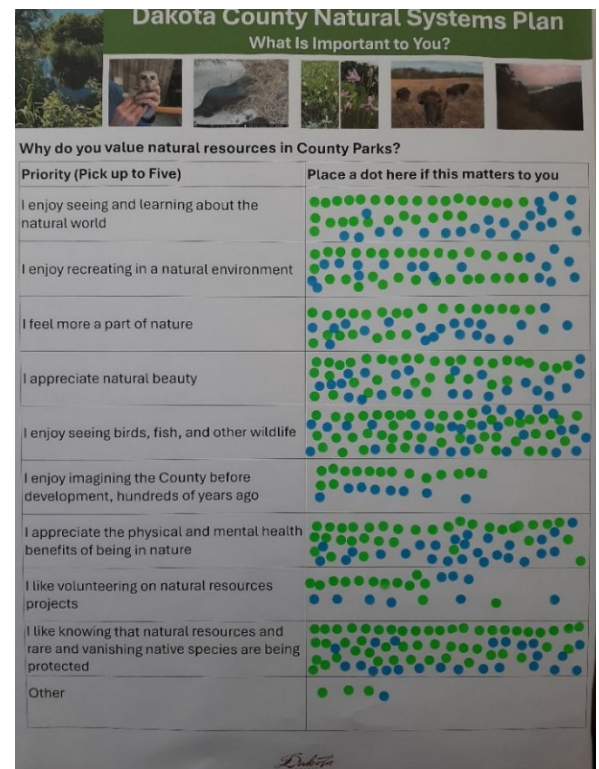


Figure 45: Bar Chart with Natural Resource Priorities

Write-In Responses:

- Educational opportunities
- Collaboration with UMN ecological research
- Walking path in beauty of nature
- Implementing accessibility for disabled nature lovers
- Earth Day every day
- Art
- Protect earth from capitalism
- Helping animals
- Meta AI building a \$800 million data center on 42 in Rosemount - not good
- Knowing that people are putting in an effort to know that plants and animals as well as the environment is safer
- Encouraging every generation, especially the next, to be mindful of their environmental impact
- Reminding us of our responsibility for the rest of nature/the universe



"Dot Board" responses, Galaxie Library

Appendix E: Acronyms

4C	City-County Conservation Collaborative, a natural resources stewardship partnership
AIS	Aquatic Invasive Species
AMA	State Aquatic Management Area
CCCC	City-County Conservation Collaborative, a natural resources stewardship partnership
CFA	Conservation Focus Area, an interconnected network of natural resource areas
CIP	Capital Improvement Program
CPCA	Dakota County Park Conservation Area
CPL	Minnesota Conservation Partners Legacy grant program
DNR	Minnesota Department of Natural Resources
DWSMA	Drinking Water Supply Management Area
EAB	Emerald Ash Borer
ELF	Dakota County Environmental Legacy Fund, derived from landfill host fees and a portion of the County gravel tax
ENRTF	Minnesota Environment and Natural Resources Trust Fund
ES	Ecosystem Services, benefits people receive from nature
FNAP	Dakota County Farmland and Natural Areas Protection Plan and Program
FTE	Full Time Equivalent, staff position
LCCMR	Legislative Citizen Commission on Minnesota Resources
LCP	Dakota County Land Conservation Plan, 2020
LSOHC	Minnesota Lessard-Sams Outdoor Heritage Council
MNRRRA	Mississippi National River and Recreation Area
NR Unit	Dakota County Parks Natural Resources Unit
NRMP	Natural Resources Management Plan, prepared for individual parks, greenways, and easements
NRMSP	Dakota County Natural Resources Management System Plan, 2017
NSP	Dakota County Natural Systems Plan, 2026
OE Unit	Dakota County Parks Outdoor Education Unit
OH	Minnesota Outdoor Heritage Fund
PFAS	Per- and polyfluoroalkyl synthetic substances, “forever” chemicals
PSI	Program and Service Inventory, countywide system of metrics reported annually
SGCN	Minnesota Species of Greatest Conservation Need
SNA	State Scientific and Natural Area
SWCD	Dakota County Soil and Water Conservation District
TBD	To be determined, e.g., future restoration work
TEK	Traditional Ecological Knowledge
TSI	Trophic State Index, a water quality parameter
VS Unit	Dakota County Parks Visitor Services Unit
WCA	Minnesota Wetlands Conservation Act
WHEP	Wetland Health Evaluation Program, a volunteer program hosted by Dakota County
WMA	State Wildlife Management Area